Applied Academics Evaluation

FINAL REPORT

February 2000

Student Assessment and Program Evaluation Branch
Ministry of Education

BRITISH COLUMBIA

Acknowledgements

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Description of Applied Academics Programs

Applied Academics programs were introduced into the provincial curriculum in 1995 and early 1996 to improve relevance through the integration of experiential learning and theoretical knowledge by using applications-oriented instructional strategies. Applied Academics programs are intended to motivate more students and assist them to make smoother transitions to the workplace and post-secondary studies. The first Grade 12 graduates and early leavers who completed Applied Academics programs entered post-secondary studies or the workplace in 1998.

At the present time, there are four Applied Academics programs offered in British Columbia: Applications of Mathematics 9 to 12, Applications of Physics 11/12, Technical and Professional Communications 12, and Information Technology 11/12. Early and pilot implementation began in 1996/97 with full provincial implementation scheduled for Grade 12 in 1998 and 1999.

The Centre for Applied Academics (CFAA) was established by the Ministry in 1996 to promote, support and assist in the development and articulation of Applied Academics programs within the Province.

Purpose and Approach of the Evaluation

The evaluation focused broadly on the four Grade 11 and Grade 12 Applied Academics programs cited above. The primary purpose of the evaluation was to determine the general level of awareness of Applied Academics in the system, the degree of implementation, the impact on student outcomes, what is working well, and the challenges faced for future success. The evaluation also examined the impact of CFAA in promoting and supporting the implementation of Applied Academics and in articulating Applied Academics with post-secondary institutions.

The evaluation approach consisted of personal interviews of various key informants, mail and telephone surveys, and on-site visits to six schools in four school districts. In addition, background information was collected from a number of other informants. The quantitative and qualitative data from 655 key informants, district superintendents, principals, teachers, current and former students, parents and others forms the basis of this report.

Evaluation Findings

Impact of Applied Academics on Students

Applied Academics have had a positive impact on participating students.

Students responded very positively about their Applied Academics experiences and the impact of these courses on their transitions from school to post-secondary education and employment. The majority (at least 60%) of Applied Academics students in the three Applied Academics student groups taken together, reported positive views on the learning activities, improved marks, understanding of course work, and how and where to apply what they learned. Further, at least 60% of these students also reported that Applied Academics improved their employability skills, such as problem solving, and the ability to work independently and in teams.

Applied Academics graduates and early leavers report a higher level of satisfaction than Non-Applied Academics graduates and early leavers.

The level of satisfaction with preparation for post-secondary studies, employment, and career plans for Applied Academics '98 graduates and early leavers was generally higher than that for Non-Applied Academics '98 graduates and early leavers. Fifty-five percent of Applied Academics '98 graduates and early leavers reported they were satisfied to very satisfied with preparation for post-secondary, 58% with preparation for the workplace, and 56% with career plans. The '98 Non-Applied Academics graduates and early leavers reported 41% were satisfied or very satisfied with preparation for post-secondary, 32% with preparation for the workplace, and 44% with career plans.

A greater percentage of Applied Academics graduates and early leavers surveyed were working or attending post-secondary than Non-Applied Academics graduates and early leavers surveyed.

The 1998 Applied Academics graduates and early leavers reported that 61% were enrolled in post-secondary studies, and 44% were working full-time. This compares with 54% of 1998 Non-Applied Academics graduates and early leavers who were enrolled in post-secondary studies, and 26% who were working full-time.

Up to 60% of responding principals, district coordinators and key informants rated Applied Academics students better than other students with respect to school retention, competence in employability skills, transition to the workplace, and to post-secondary studies.

The majority of Applied Academics current students, graduates and early leavers and parents would recommend Applied Academics.

The majority of Applied Academics students would recommend these programs to other students, and indicated that their employability skills, analytical skills, and the ability to understand technical documents had improved. The three Applied Academics student samples were more satisfied (69%, 55% and 61% for Grads AA '99, Grads AA '98 and Current Students, respectively) with their academic achievement than the '98 Non-Academics graduates and early leavers sample of which 34% were satisfied.

The majority of parents/guardians samples reported positive effects of Applied Academics on their son or daughter. Examples of areas in which at least 60% of parents expressed that they were satisfied or very satisfied with the impact of Applied Academics on their son or daughter include: future plans, self-esteem, and school achievement.

Impact of Applied Academics on the System

Increase in Applied Academics enrolments varies.

Based on student enrolments, the degree of implementation of Applied Academics has increased from the 1996/97 to the 1998/99 school year. Implementation is greatest in Information Technology, a course that was intended to replace Computer Science.

The 1998/99 Ministry data reported that students from 35 schools in 21 school districts had received credit for Grade 11 and/or Grade 12 Applied Academics in one or more of the following: Applications of Mathematics 11/12, Applications of Physics 11/12, and Technical and Professional Communications 12. Based on the provincial enrolment data, the percentage of Grade 11 and 12 students enrolled in Applied Academics, other than Information Technology, was 0.5% in 1997/98 and 1.2% in 1998/99. Information Technology, which overlapped with, and was intended to replace Computer Science, enrolled 9.8% in 1997/98 and 10.6% in 1998/99 of the total Grade 11 and 12 provincial enrolments.

Awareness, promotion and support of Applied Academics in the system is limited.

Analysis of surveys and on-site visits indicated that the general levels of awareness, promotion and support of Applied Academics programs varied. Educators and key informants rated parents, Boards of Trustees and communities as having a low to average level of awareness, promotion and support of Applied Academics programs, while they perceived that teachers, counsellors, principals, students and district staff demonstrated a higher level.

About half the students surveyed had received some active encouragement to take Applied Academics and only a small number were discouraged from taking Applied Academics. The most frequent source of student encouragement to enrol in Applied Academics came from teachers and counsellors. The most frequent source of discouragement came from parents, other teachers and friends.

Educators agreed that Applied Academics has had some impact on instruction in schools offering programs.

Teachers' and principals' views on the impact of Applied Academics on teaching strategies in regular curriculum varied. Of the 15 principals who responded, 53% agreed that there was an impact, 20% indicated no impact, 7% felt that it was too soon to tell and 20% were not sure. Thirty-nine percent of 28 responding teachers reported that Applied Academics had an impact on instruction, 32% no impact, 7% felt it was too soon to tell, and 21% were not sure.

Impact of Applied Academics is greatest on participating students and very limited on the system.

Overall, the perception was that the impact of Applied Academics has been highest on students. Of the 70 respondents, 17% of key informants, 7% of superintendents, 40% of principals, and 72% of teachers agreed that Applied Academics had a positive impact on participating students. Only 5.7% of the 70 respondents reported a positive impact of Applied Academics on participating sites. Of the 70 respondents, 8.6% reported some impact of Applied Academics on the system, 24% reported minimum impact, 8.6% reported resistance to Applied Academics, and nearly 10% indicated that it was too early to tell or that they did not know.

Clear articulation with post-secondary institutions is limited.

It was reported by three-quarters of responding educators that the lack of clear articulation with post-secondary institutions was a barrier to Applied Academics enrolments and created concerns with parents and students. Currently, Applied Academics courses do not fully meet most university requirements for direct entrance into their programs. Specific additional requirements for Applied Academics are stipulated by a number of institutions in order to meet entry requirements into university transfer and degree programs. Students reported that accurate information they get at school is not readily accessible and sometimes the information provided is misleading.

Future Directions of Applied Academics

Key informants and educators identified aspects of Applied Academics that are working well.

The success of what is working well can influence future directions. Sixty-six of 88 key informants, superintendents, principals and teachers, responded to the question of what is working well in the implementation of Applied Academics. In rank order, 28% identified committed teachers, 20% supported Applications of Mathematics, 18% chose practical applications for students, 17% agreed on leadership support, 14% selected Information Technology, 9% agreed on resources and on workshops, and 6% reported Technical and Professional Communications.

Respondents said that Applied Academics faces a number of challenges.

Most teachers, counsellors, principals, and key informants identified challenges that need to be addressed in implementing Applied Academics. Challenges included establishing the following: supportive leadership, flexible timetables, sufficient counselling services, appropriate provincial examinations, clear articulation with post-secondary institutions, adequate resources and equipment for implementation, program acceptance by parents and the education system, sufficient in-service, and effective strategies to encourage students to enrol. When asked to respond to the form of support needed for Applied Academics, three-quarters of respondents agreed that more support and resources were needed to address these challenges.

Centre for Applied Academics (CFAA)

The Centre for Applied Academics has had some impact in providing implementation support for Applied Academics programs.

Of 88 key informants, superintendents, principals and teachers surveyed, 52% were familiar with the work of the CFAA and responded to the CFAA questions on the survey. Of those who were familiar with CFAA, 61% rated the CFAA website very effective or effective, 39% rated implementation resources as very effective or effective, and 40% rated in-service as very effective or effective.

The impact of CFAA in developing good relationships and promoting awareness and advocacy with various groups is limited within the system.

Fifty-four percent of key informants, superintendents, principals and teachers who were familiar with CFAA, rated CFAA's development of good relationships as effective or very effective. The advocacy role of CFAA was rated effective or very effective by 41% of the 39 respondents, and 32% of 38 respondents rated the development of awareness of Applied Academics as effective or very effective.

The CFAA's role in facilitating articulation was rated effective by less than half of the respondents.

CFAA's facilitation of articulation with colleges was rated as effective or very effective by 41% of the 39 responding key informants, superintendents, principals, and teachers. CFAA's facilitation of articulation with universities was rated effective or very effective by 17% of the same respondents. CFAA's facilitation of student transition to the workplace was rated effective or very effective by 20% of these respondents.

Respondent opinions on the advantages and disadvantages of a non-government administration of programs varied.

Respondents were asked their opinions on the advantages and disadvantages of having a non-government agency such as the CFAA, administer and facilitate Applied Academics programs. Overall, approximately one-third of 57 respondents (key informants, superintendents, principals, and teachers) commented that the major advantages of a non-government agency were freedom from political constraints and the ability of an agency to be more responsive. Overall, approximately two-thirds of respondents commented that the major disadvantages of a non-government agency were that it was not an integral part of the system; and it lacked the necessary influence on policy and implementation processes.

Overall Conclusions

Applied Academics programs have been successfully implemented in some schools and school districts resulting in positive outcomes for students. Examples of positive outcomes where programs have been implemented include student improvements in the following: academic achievement, skill development, ability to apply what is learned, preparation for entry into post-secondary studies and/or the workforce, and the desire to continue learning. In addition, Applied Academics was viewed as having a positive impact on student retention, student interest in learning, and student satisfaction levels.

Applied Academics, in these early stages of implementation, has made some impact on the system in terms of student enrolments, the number of schools offering the programs, and articulation. During site visits, it was noticed that the implementation of Applied Academics has increased some educators' awareness of the underlying principles which address learning styles, instructional strategies, and the application of learning.

Support for Applied Academics is somewhat limited due to lack of information on program outcomes, a perception that courses are academically inferior, lack of full acceptance by post-secondary institutions, constraints in the system, lack of resources, and effective communication, among others. Successful implementation has been achieved where there has been school and/or district leadership and support, and where teachers have been committed to the concept. Addressing the barriers and the implementation needs identified in this report can have a positive impact on future implementation.

If the demonstrated benefits of Applied Academics programs are to be passed on to more students, there is a need for the Ministry to provide the leadership and support for program implementation. The impact of a non-government agency, responsible for promotion and support of implementation of Applied Academics in the school system, has been limited to a few successful sites.

Some issues that an agency may find difficult to deal with include: setting provincial policies and procedures; establishing communication infrastructures with districts, schools and communities; developing curriculum; selecting and allocating resources; influencing provincial examinations; articulating provincial courses with post-secondary institutions; and, participating with certification bodies and organizations, such as the College of Teachers, professional educational associations and other ministries.

Nevertheless, if the Ministry chooses to assume responsibility for a number of these activities, it may still wish to allocate specific tasks to an agency to assist in the support required for Applied Academics. However, student successes and the positive experiences of school offering Applied Academics programs over the last few years can provide the basis for continued growth and success.

1. Introduction

1.1 Overview of Applied Academics Programs

Applied Academics programs were introduced into provincial curriculum in 1995 and early 1996 to improve relevance through the integration of experiential learning and theoretical knowledge by using applications-oriented instructional strategies. Applied Academics is intended to accommodate a wider range of learning and teaching styles to help students make the transition to a broader range of post-secondary opportunities and career pathways. Applied Academics programs are intended to motivate more students, improve student retention, and assist students with smoother transitions to the workplace and post-secondary studies.

The question of how to prepare more students for transition to post-secondary studies and/or entry into the workplace has been the theme of numerous initiatives in education over the past ten or more years. Examples of some of these initiatives are cited in this report to provide a context of Applied Academics for the reader.

The evolution of a knowledge-based global economy, rapidly advancing technology, and the shift from a resource based labour market, placed additional demands on the educational system. In the early 1990's, The Conference Board of Canada developed "Employability Skills", which focused on the practical application of skills, and attitudes in the workplace to address the impending issues. These skills are now evolving into "Essential Skills" that include literacy, communication, numeracy, critical thinking, teamwork, and computer skills, among others. Reports from numerous human resource task forces and economic summits addressed and made recommendations on the issue of workplace awareness education. Consequently, it became even more important for students to acquire employability skills within the learning outcomes of curriculum and to understand what they were learning, why it was important to learn it, and how it will be used in the outside world.

Following the Sullivan Royal Commission on Education Report (1988), career development became one of the goals of education in British Columbia, thereby creating the need to examine the relevance of curriculum and instructional practices. Initiatives such as the Stay in School Initiative (1992/94), the Secondary School Project (1993/94), the Business, Labour, Education Forums (1994), and the Skills Now! Project (1994/96), were designed to involve educators and the community in seeking solutions to the problem of preparing more students for post-secondary studies, career paths, and entry into the workforce. The impact of this input was evident when, in the fall of 1994, the Ministry announced the new Graduation Program. This program included Career and Personal Planning and 30 hours of work experience as a graduation requirement. From 1990 to 1999, Career Preparation Programs, designed to provide students with entry level skills to the workplace and/or post-secondary education, expanded significantly from 10% to 48% of Grade 11 and 12 enrolments.

Various measures were taken to address the needs of students. In 1994 the Ministry funded seven schools to pilot Principles of Technology and initiated the Secondary School Apprenticeship Programs. In 1995, Applications of Mathematics 11 and 12, and Technical and

Professional Communications 12 were introduced as pilot courses. From 1996 to 1998, Information Technology 11 and 12, which was intended to replace Computer Science 11 and 12, was introduced and Applications of Physics 11 and 12 were introduced to replace Principles of Technology. During the time these courses were developed, Instructional Resource Packages (IRP's) K-12 were reviewed for contextual application, "hands-on learning", career development, and employability skills. The purpose of the review was to embed applied learning and teaching strategies into the curriculum to better meet the needs of students. With the release of the new and revised curriculum, Applied Academics became part of the secondary school graduation program.

At the time of reporting, four programs in British Columbia are identified as Applied Academics programs. Secondary schools may offer Applications of Mathematics 9 to 12, Applications of Physics 11 and 12, Technical and Professional Communications 12, and Information Technology 11 and 12. Although some schools and districts began early pilots, full provincial implementation dates for Grade 12 Applied Academics courses began in September 1998. The first Grade 12 graduates and early leavers taking the pilot courses entered post-secondary studies or the workplace in 1998.

1.2 Centre for Applied Academics

In 1996, the Ministry of Education established the Centre for Applied Academics (CFAA). The Ministry contracted with the British Columbia Institute of Technology (BCIT) to provide administrative support for the CFAA. A Board of Directors, comprised of six representatives from business, secondary and post-secondary education, and the Ministry of Education, was appointed.

The mission of the CFAA is to champion the better preparation of a larger number of secondary school graduates and early leavers for entry into post-secondary studies and the workplace. The overall success of the Centre depends on the relationships formed with Ministry branches, Government agencies, groups involved with the K-12 system, post-secondary institutions, business, and labour groups. The mandate of the Centre is to work in partnership with the Ministry to promote, support, and assist in the development of Applied Academics programs within the Province. According to Ministry records, this mandate includes the following outcomes:

- to create awareness of Applied Academics among students, teachers, counsellors, parents, etc.;
- to perform an advocacy role for the promotion and development of Applied Academics;
- to articulate Applied Academics courses for entry into the post-secondary system and to career pathways (i.e. facilitate student transition either to further study or to employment); and
- to develop and provide support material and services for implementation (e.g. learning resources and in-service training).

The initial set-up costs and operating funding in 1997/98 for CFAA was $470,064. Operating funding for 1998/99 was $335,150, and for 1999 to 2000 is $305,000, annually. In addition to the operating funds, there are funds for learning resources, $195,000 in 1997/98, and roughly

$159,000 in 1999 and 2000, as well as special initiative funding of $25,000 in 1999 and 2000. The CFAA has also obtained federal government funding of approximately $600,000 for the Applications of Working and Learning (AWAL) Project, a professional development initiative to assist teachers to create lessons based on authentic workplace applications.

1.3 Purpose and Objectives of the Evaluation

The evaluation focused broadly on the four Grade 11 and 12 Applied Academics programs (Applications of Mathematics, Technical and Professional Communications, Information Technology, and Applications of Physics) as outlined above, and looked at the Centre for Applied Academics in terms of its impacts and effects on applied programs. The evaluation also looked at the impact or influence of Applied Academics on the teaching of the general curriculum.

The evaluation reports on the current state of Applied Academics, including examination of levels of awareness, participation levels, student profiles, student outcomes, impacts, and key operational challenges facing applied programs. The evaluation also examined the role of the Centre in developing and articulating agreements with post-secondary institutions, and in promoting and supporting the implementation of Applied Academics through training, resource materials, and a website.

The evaluation was designed to meet the following objectives:

- to determine the general level of awareness of Applied Academics among students, teachers, counsellors, parents and others, and to determine the specific contributions of the Centre to that awareness;
- to determine the degree of implementation of Applied Academics in the school system and specific contributions of the CFAA to that implementation;
- to determine the impacts of Applied Academics on teaching methods and student outcomes, and the specific contributions of the CFAA to that impact;
- to identify what is working well, and current challenges facing the success of Applied Academics; and
- to make recommendations for continued support of Applied Academics for current and future success.

1.4 Evaluation Methodology and Research Activities

To meet the evaluation objectives, quantitative and qualitative data collection instruments and methods were designed. The evaluation plan consisted of three main components: key informants and stakeholders; student, parent and school staff surveys; and on-site visits.

Key Informants and Stakeholders

The first component included completion of 69 surveys, and personal and telephone interviews with various key informants and stakeholders. Included among key informants are CFAA Board of Directors and staff, and Ministry and Post-Secondary personnel. Included among Stakeholders are Superintendents, Principals, District Coordinators and Counsellors.

Student, Parent and School Staff Surveys

A telephone survey was conducted of the 1997/98 graduates and early leavers who had completed Applications of Mathematics 11 or 12 or both, or Technical and Professional Communications 12 (n = 98), as well as graduates and early leavers who had not participated in any Applied Academics programs, but who completed Principles of Mathematics 11 or 12 or both, or English 12 (n = 89). These two cohorts were matched according to achievement levels in English or Mathematics. Further details are located in *Appendix A* of this report.

A mail-out survey was conducted of 1998/99 graduates and early leavers (n = 93). The same student survey (n = 100 in-school students) and a teacher/counsellor survey (n = 38) were distributed in fourteen schools that offered Applications of Mathematics 11 or 12 and/or Technical and Professional Communications 12. Parent surveys (n = 41 completions) were mailed out and followed up with telephone calls.

On-Site Visits

The third component consisted of on-site visits to six schools to conduct three focus group sessions with 127 students, teachers, counsellors, administrators and parents, and to gather information for two case studies. To ensure a cross section of the Province was represented, on-site visits were made to schools offering Applied Academics programs in three different regions of the Province.

Depicted in Table 1-1 is a summary of the groups surveyed, the survey activities, and the number of completions. Additional details and copies of survey instruments developed for the evaluation are located in the *Technical Appendix* to this report.

Table 1-1

Research Activities Completed

Group	Survey Vehicle	Sample Source	Completions
Key Informants, Stakeholders			
Key Informants: CFAA, Ministry personnel post-secondary personnel	Personal and telephone interviews	Ministry files research	13 surveys 16 interviews
Stakeholders: superintendents principals district coordinators/counsellors	Mail out, fax, telephone surveys, and personal interviews	Identified by coordinators and others, Ministry files	17 superintendents 20 principals 3 district staff
Student, Parent, School Staff Surveys			
1998/99 recent graduates and early leavers and current students who completed Applications of Mathematics 11 or 12 or TPC 12	Mail out surveys and telephone follow-up. In-school distribution of surveys for current students	Ministry data files random selection	93 graduates and early leavers 100 in-school students
1997/98 AA graduates and early leavers 1997/98 Non-AA graduates and early leavers	Telephone directory search and interviews of 1997/98 AA students Non-AA students	Ministry data files random selection	98 AA 89 Non-AA
Parents of current or former AA students	Mail out to parents with follow-up calls	Ministry data files random selection	41 completions
AA teachers and counsellors Non-AA teachers and counsellors	School distributed surveys	Identified by coordinators and others, Ministry files	38 completions
On-site visits			
Focus Groups at three sites (teachers, students, parents, counsellors)	On-site visits Visited Math, TPC, and IT classrooms. Met with AA and Non-AA teachers	School based selection	60 students 33 teachers 21 parents 13 key informants
Case Studies at 3 site visits	Case study protocol		
TOTAL			**655**

1.5 Data Analysis and Interpretation

Following the completion of survey administration, data entry of all quantitative data from the surveys was processed and comments from open-ended questions were entered for analysis. An extensive review of all qualitative data was conducted. Given the nine groups surveyed and the numerous personal interviews, many observations were not easily translated into statistical data for analytical purposes.

Some sections of the report contain limited quantitative data and others contain considerable statistical data. The reader should consider that the findings of this report represent analysis of quantitative and qualitative data gathered from a broad group of participants, as well as first hand observations from site visits and personal interviews.

1.6 Limitations of the Evaluation

The *Applied Academics Evaluation* consists of two components: Applied Academics implementation and outcomes, and the impact of the CFAA on Applied Academics. The following factors need to be considered in interpretation of the evaluation findings.

- There were only a limited number of schools and districts where Applied Academics courses (Applications of Mathematics 11/12, Technical and Professional Communications 12, and Applications of Physics 11/12) had been implemented. This restricted the sampling to a small number of implementation sites. In spite of this restriction, the data can be viewed as being representative of the sites available.

- Students who graduated in 1998 may have taken only one Applied Academics course, generally Applications of Mathematics. As such, their input is based only on early stages of implementation and limited exposure to the program.

- The Ministry database lists students who received credit for course completion at Grade 11 and 12 levels, including continuing education, and distance education students. It is therefore difficult to identify schools that offer classroom-based Applied Academics programs from only the Ministry database.

- Information Technology 11/12 is offered in almost all schools, but schools offering only Information Technology and no other Applied Academics courses were not surveyed, as the Ministry intended Information Technology to replace Computer Science.

- Applications of Mathematics 9/10 are not included in this report. These statistics are not captured in the Ministry's TRAX system. These students, however, form the base for future enrolment in Applications of Mathematics 11/12.

1.7 Organization of the Report

The results of the *Applied Academics Evaluation* are presented under the following headings:

1. Introduction
2. Implementation of Applied Academics programs
3. Impacts of Applied Academics
4. Employment and Post-Secondary Outcomes
5. Other Impacts of Applied Academics programs
6. Impact of CFAA on Applied Academics
7. Summary of Findings and Conclusions
8. Appendices

Technical Appendix: The Technical Appendix contains details regarding research methodology and activities completed, copies of survey instruments and respondent letters, selected respondent comments, and statistical information. The Technical Appendix is provided under separate cover.

2. Implementation of Applied Academics Programs

2.1 Student Enrolment

According to Ministry data on student completions in 1998/99, there were 35 schools in 21 school districts that offered Applied Academics courses in Mathematics 11/12, Technical and Professional Communications 12, and Physics 11/12. The number of Applied Academics course completions from 1994/95 to 1998/99 is presented in Table 2-1(a).

Table 2-1(a)

Number of Course Completions for Applied Academics Courses, 1994/95 to 1998/99

Course	94/95	95/96	96/97	97/98	98/99
Applications of Mathematics 11	0	0	52	315	672[1]
Applications of Mathematics 12	0	0	0	109	130[1]
Technical and Professional Communications 12	0	0	0	91	187[1]
Applications of Physics 11	0	0	0	9	183[1]
Applications of Physics 12	0	0	0	0	6[1]
Information Technology 11	1	3	744	7850	7316[2]
Computer Science 11	*9444*	*8586*	*7283*	*46*	*0*[2]
Information Technology 12	0	1	215	1902	3549[2]
Computer Science 12	*3067*	*3019*	*2755*	*1565*	*0*[2]
Grade 11 enrolment[3]	**44934**	**46437**	**50106**	**51705**	**54241**
Grade 12 enrolment[3]	**42085**	**43592**	**45264**	**47556**	**47926**

1. Course Completion numbers for 1998/99 are preliminary. Some schools had not submitted 1998/99 Course Completions data at the time of data collection, which can affect the accuracy of percentage completions.
2. Information Technology 11 and 12 was intended to replace Computer Science 11 and 12 by 1998/99.
3. Total enrolments do not include continuing education enrolments

Table 2-1(b)

Students Who Completed Grade 11 or Grade 12 Applied Academics Courses as a Percentage of the Total Enrolment for each Grade, 1994/95 to 1998/99

Course	94/95	95/96	96/97	97/98	98/99
Applications of Mathematics 11	-	-	0.1%	0.6%	1.2%
Applications of Mathematics 12	-	-	-	0.2%	0.3%
Tech. and Prof. Communications 12	-	-	-	0.2%	0.4%
Applications of Physics 11	-	-	-	< 0.1%	0.3%
Applications of Physics 12	-	-	-	-	< 0.1%
Information Technology 11	< 0.1%	< 0.1%	1.5%	15.2%	13.5%
Computer Science 11	*21.0%*	*18.5 %*	*14.5%*	*0.1%*	-
Information Technology 12	-	< 0.1%	0.5%	4.0%	7.4%
Computer Science 12	*7.3%*	*6.9%*	*6.1%*	*3.3%*	-

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Applications of Mathematics 12	-	-	-	0.2%	0.3%
Tech. and Prof. Communications 12	-	-	-	0.2%	0.4%
Applications of Physics 11	-	-	-	< 0.1%	0.3%
Applications of Physics 12	-	-	-	-	< 0.1%
Information Technology 11	< 0.1%	< 0.1%	1.5%	15.2%	13.5%
Computer Science 11	*21.0%*	*18.5 %*	*14.5%*	*0.1%*	-
Information Technology 12	-	< 0.1%	0.5%	4.0%	7.4%
Computer Science 12	*7.3%*	*6.9%*	*6.1%*	*3.3%*	-

Table 2-1(b) presents the number of students who completed each Grade 11 or Grade 12 Applied Academics course as a percentage of the enrolment for that grade. It shows that enrolments in Applied Academics have increased since the initial implementation in 1996. The largest percentage of students enrolled in Applied Academics is in Information Technology 11 and 12, and a very small percentage of students are enrolled in the other Grade 11 and 12 Applied Academics courses.

In relation to the total enrolments in Grade 11 and 12, the percentage of students in Applications of Mathematics 11/12, Technical and Professional Communications 12, and Applications of Physics 11/12 increased from 0.5% in 1997/98 to 1.2% in 1998/99. Information Technology 11 and 12 was intended to replace Computer Science by the 1998/99 school year. Enrolments in Information Technology and Computer Science together decreased from 11.4% in 1997/98 to 10.6% in 1998/99. This may be due in part to the preliminary nature of the 1998/99 completion data. Overall, the enrolment in the Applied Academics courses other than Information Technology is low, but increasing.

Survey respondents anticipated that enrolments in Applied Academics will increase if a number of issues are addressed. Superintendents, principals and teachers surveyed were asked if an increase in enrolment was anticipated within the next three years. Close to half the teachers and about half the principals responded with a qualified "yes". They anticipate increased enrolments if there is effective acceptance of programs, post-secondary articulation, support, and resources for Applied Academics. The "no" response was qualified by comments that outlined a number of barriers such as resistance by some teachers and parents, large classes, graduation requirements, articulation, and funding. Table 2-2 provides a breakdown of responses to this question.

Table 2-2

Anticipated Enrolment Increases in Applied Academics

Respondent	Number Responding	Yes	No	Don't Know
Superintendents	16 of 17	25%	50%	25%
Principals	19 of 20	53%	26%	21%
Teachers	36 of 38	44%	31%	25%

2.2 Profiles of Student Respondent Samples

The survey began with a number of questions to develop profiles of the students in each of the four respondent groups. Applied Academics '98 graduates and early leavers were matched with Non-Applied Academics '98 graduates and early leavers so that a valid comparison could be made. The average letter grade of the respondents ranged from C to B. Details of the selection of these samples are located in *Appendix A* of this report. Applied Academics '99 graduates and early leavers were randomly selected from the census population supplied by the Ministry. Most of these three student cohorts were working or enrolled in a post-secondary institution. Current Applied Academics students were enrolled in Applications of Mathematics and/or Technical and Professional Communications. Further information and data on all students surveyed is located in *Appendix B* of this report.

2.3 Student Selection for Applied Academics

Most of the teachers surveyed (25 of 38) were familiar with the objectives of Applied Academics and identified a wide variety of students as targets for Applied Academics. When asked to identify the objectives of Applied Academics, their comments related to instruction, such as relevance to the real world, transition to the workplace and post-secondary education, and "hands-on" experiences. One teacher stated that it was a "philosophy of learning". Key informant responses were very similar.

Multiple responses were made by responding teachers to the question, "Which students have been targeted for Applied Academics programs in your school?" These responses ranged from gifted to low ability. Of the 93 responses, 34 were specific types of students, such as gifted, career preparation, or potential drop-outs; 15 were all students; and 44 targeted the ability level of students (3 chose A, 6 chose B, 12 chose C+, 13 chose C and 10 chose C-).

In general, a specific approach to introduce students to Applied Academics was not identified by responding teachers and principals through either the surveys or the focus groups. Fourteen of twenty principals reported that students were introduced to Applied Academics in three ways: six indicated that students received this information from teachers, counsellors and principals; five credited parent/teacher evenings; and three identified course description information as the vehicle for introducing students to Applied Academics.

2.4 Students' Awareness of Applied Academics

Current and former students who had taken any Applied Academics courses were asked questions about how they had found out about the courses and whether anyone had encouraged or discouraged them for taking these courses.

Overall, about half the students reported that they had been encouraged to enrol in Applied Academics courses (49% of AA '98, 57% of AA '99, and 48% of Current AA samples). Counsellors were the most frequently reported source of encouragement for all three groups (reported by 40% of AA '98, 31% of AA '99, and 44% of Current AA samples). Other frequently mentioned sources were:

- Applied Academics teachers (31% of AA '98, 27% of AA '99, and 6% of Current AA samples);
- Other teachers (4% of AA '98, 38% of AA '99, and 38% of Current AA samples);
- Parents (13% of AA '98, 19% of AA '99, and 31% of Current AA samples); and
- Friends (2% of AA '98, 19% of AA '99, and 15% of Current AA samples).

The influence of other teachers and friends was much greater for the '99 former students and the current students than they were for the '98 former students, perhaps indicating a growing awareness and/or acceptance of Applied Academics.

Although about half the students were not encouraged to enrol in Applied Academics, most were not discouraged. Almost no students from the Applied Academics '98 former student sample were discouraged (3%), but a sizable minority of the students from the other two

samples reported that they had been discouraged from enrolling in Applied Academics (15% of the Applied Academics '99 former student sample, and 22% of the current Applied Academics student sample). Parents and friends were the source of discouragement for both groups. The current Applied Academics sample also reported that other teachers were a source of discouragement. Comments made by parents and teachers in focus groups indicate a perceived lack of acceptance of Applied Academics by post-secondary institutions is one reason for discouraging students from enrolling in Applied Academics.

Current and former students who had taken Applied Academics courses were also asked how they had found out about the courses. For all three sample groups, counsellors were reported as a source of information by more people than were any other sources (39% of AA '98, 54% of AA '99, and 54% of Current AA samples). Other teachers (8% of AA '98, 32% of AA '99, and 27% of Current AA samples), the school course calendar (ranging from 23% to 33%) and, to a lesser extent, Applied Academics teachers (about 16%) were other frequently mentioned sources for all groups. Those from the Applied Academics '99 former student sample and the current Applied Academics students sample also cited friends (about 18%), other students (19% and 10%, respectively), principals (10% and 21%), and vice principals (12% and 16%).

3. Impacts of Applied Academics

3.1 Comparison of Applied Academics and Non-Applied Academics Courses

3.1.1 Views of Students and Former students

Current and former students who had taken Applied Academics courses were asked to compare Applied Academics courses with Non-Applied courses on a number of factors. Respondents were given a number of statements, each describing some positive impact of Applied Academics, and asked to indicate whether or not they agreed or disagreed with each, using a five-point scale (with 1 being "Strongly Disagree" and 5 being "Strongly Agree"). Figure 3-1 shows each statement they were asked to rate, and the percentage of respondents in each group who agreed or strongly agreed with the statement. Since the statements were all worded as positive statements about Applied Academics in comparison to Non-Applied Academics courses, agreeing with the statement meant the respondent felt that Applied Academics courses were better than Non-Applied Academics courses in this specific way.

Figure 3-1 shows that overall, the majority (ranging from 50% to 80%) of Applied Academics '98 former students agreed with almost all statements on how Applied Academics courses were better than Non-Applied Academics courses. The majority of Applied Academics '99 former students agreed with many of the statements, while current students tended to have more neutral views. Current students were also more likely to give "don't know" responses than were respondents in the other two groups.

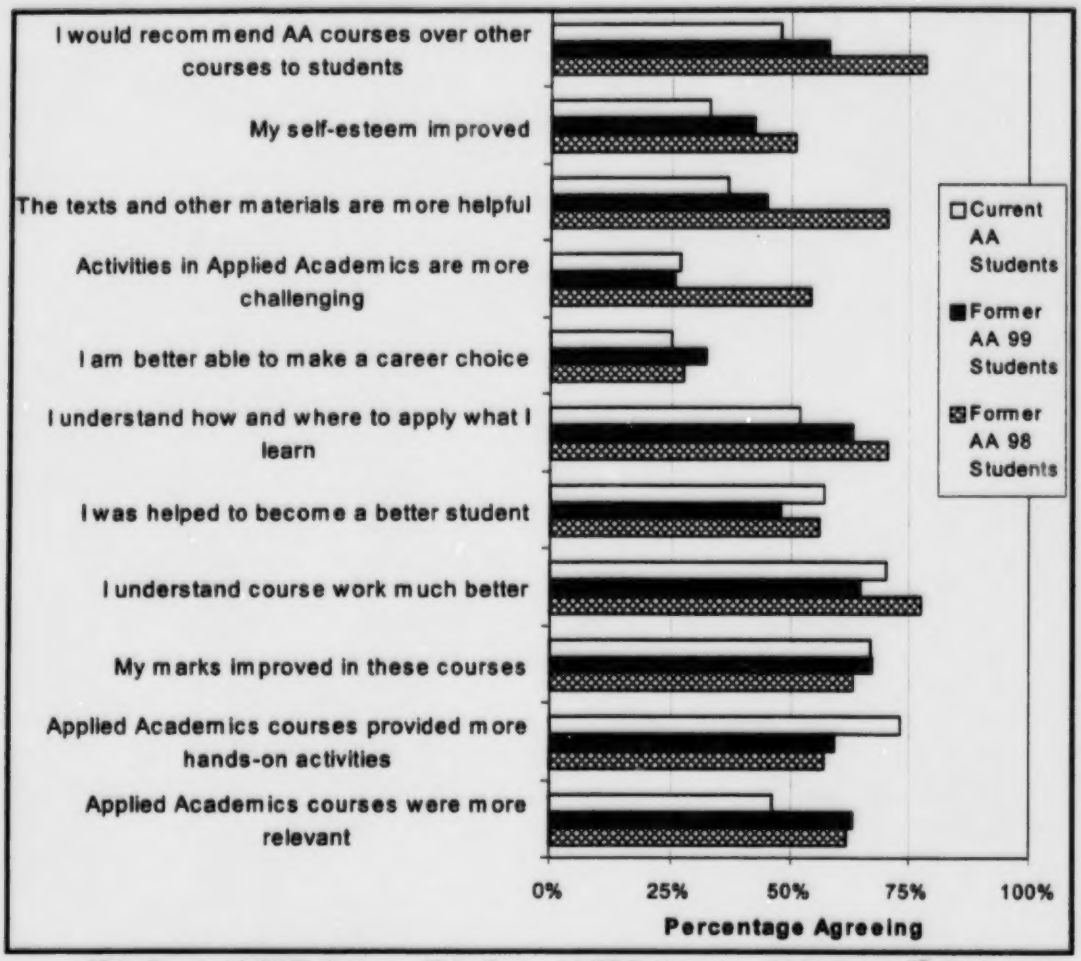
More than half of the current and former students agreed with the seven following statements comparing Applied Academics courses to Non-Applied Academics courses (in order from the highest level of agreement, to the lowest level of agreement):

- I understand course work much better.
- My marks improved in these courses.
- Applied Academics courses provide more hands-on activities.
- I understand how and where to apply what I learn.
- I would recommend AA courses over other courses to students.
- Applied Academics courses were more relevant.
- I was helped to become a better student.

The three sample groups had different views on whether the texts and other materials in Applied Academics courses were more helpful than in Non-Applied Academics courses. Almost three-quarters of the Applied Academics '98 former student sample felt they were more helpful, compared to 45% of the Applied Academics '99 former student sample and 37% of the current Applied Academics sample. The groups also differed on whether they found activities in Applied Academics to be more challenging. Just over half of the Applied Academics '98 former student sample felt Applied Academics to be more challenging, and only about a quarter of the other two groups felt that way.

Figure 3-1

Comparison of AA with Non-AA Courses by Applied Academics Students: Percentage of Respondents Who Agreed or Strongly Agreed with Each Statement in Terms of How Applied Academics Courses Compared to Non-Applied Courses



n = 98 for Former AA '98 Students; n = 93 for Former AA '99 Students; n = 100 for Current AA Students

Views on the impact on self-esteem were mixed. About half of the Applied Academics '98 former student sample, 42% of the Applied Academics '99 former student sample, and a third of the current Applied Academics sample felt their self-esteem improved, however, a quarter to a third felt it had no effect. Only a minority (a third or less) of all three groups felt that they are better able to make a career choice. Forty-two percent of the Applied Academics '98 sample disagreed, while 40% of the Applied Academics '99 former student sample and 37% of the current Applied Academics student sample were neutral.

Respondents in the Applied Academics '99 former student and the current Applied Academics samples were also asked to comment on how instruction in the Applied Academics subjects had differed from other academic subjects, such as Mathematics and English. Most of the

responses described the instruction of Applied Academics in more favorable terms than instruction of Non-Applied Academics. The most frequent types of comments were:

- more real life, hands on application (21% of AA '99, 29% of Current AA);
- easier to understand (36% of AA '99, 11% of Current AA);
- more time and more help provided (16% of AA '99, 10% of Current AA);
- better, clearer instruction (18% of AA '99, 13% of Current AA);
- not much difference (0% of AA '99, 18% of Current AA);
- Applied instruction was poorer (7% of AA '99, 1% of Current AA);
- no text books for applied courses (0% of AA '99, 6% of Current AA); and
- Applied material was harder (0% of AA '99, 4% of Current AA).

3.1.2 Perceptions of Principals and Key Informants

Table 3-1 shows the percentage of principals and key informants who rated Applied Academics students as better or worse than other students on competence in employability skills, school retention, transition to the workplace, and transition to post-secondary education. A majority of respondents claimed that students in Applied Academics have an equal or greater chance than other students for staying in school and transition to the workplace. A significant proportion also said that students in Applied Academics had better competence in employability skills.

Table 3-1

Comparison of Applied Academics Students to Other Students

		Much Worse/ Worse		Same		Better/Much Better		Don't Know	
	N	n	%	n	%	n	%	n	%
School retention									
Key Informants	11	0	0%	1	9%	6	55%	4	36%
Principals	14	0	0%	2	14%	7	50%	5	36%
Competence in employability skills									
Key Informants	11	0	0%	2	18%	5	45%	4	36%
Principals	15	0	0%	4	27%	6	40%	5	33%
Transition to workplace									
Key Informants	11	0	0%	0	0%	7	64%	4	36%
Principals	14	0	0%	2	14%	7	50%	5	36%
Transition to post-secondary									
Key Informants	10	0	0%	1	10%	3	30%	6	60%
Principals	13	2	15%	0	0%	3	23%	8	62%

3.2 Impact of Applied Academics on Development of Employability Skills

3.2.1 Views of Students and Former Students

Students who have had post-secondary or workplace experience rated the impact of Applied Academics courses higher on improving employability skills than students who are still in school or those that have recently left school.

Respondents who had taken Applied Academics courses were asked to rate how effective Applied Academics was in helping them to improve a number of specific employability skills. The skills and the percentage of respondents in each group that gave an "effective" or "very effective" rating are provided in Figure 3-2.

Overall, there was a higher degree of consensus among the respondents in the Applied Academics '98 former student sample than in the other two samples about what skills were improved by Applied Academics. The current Applied Academics sample showed the lowest degree of consensus overall.

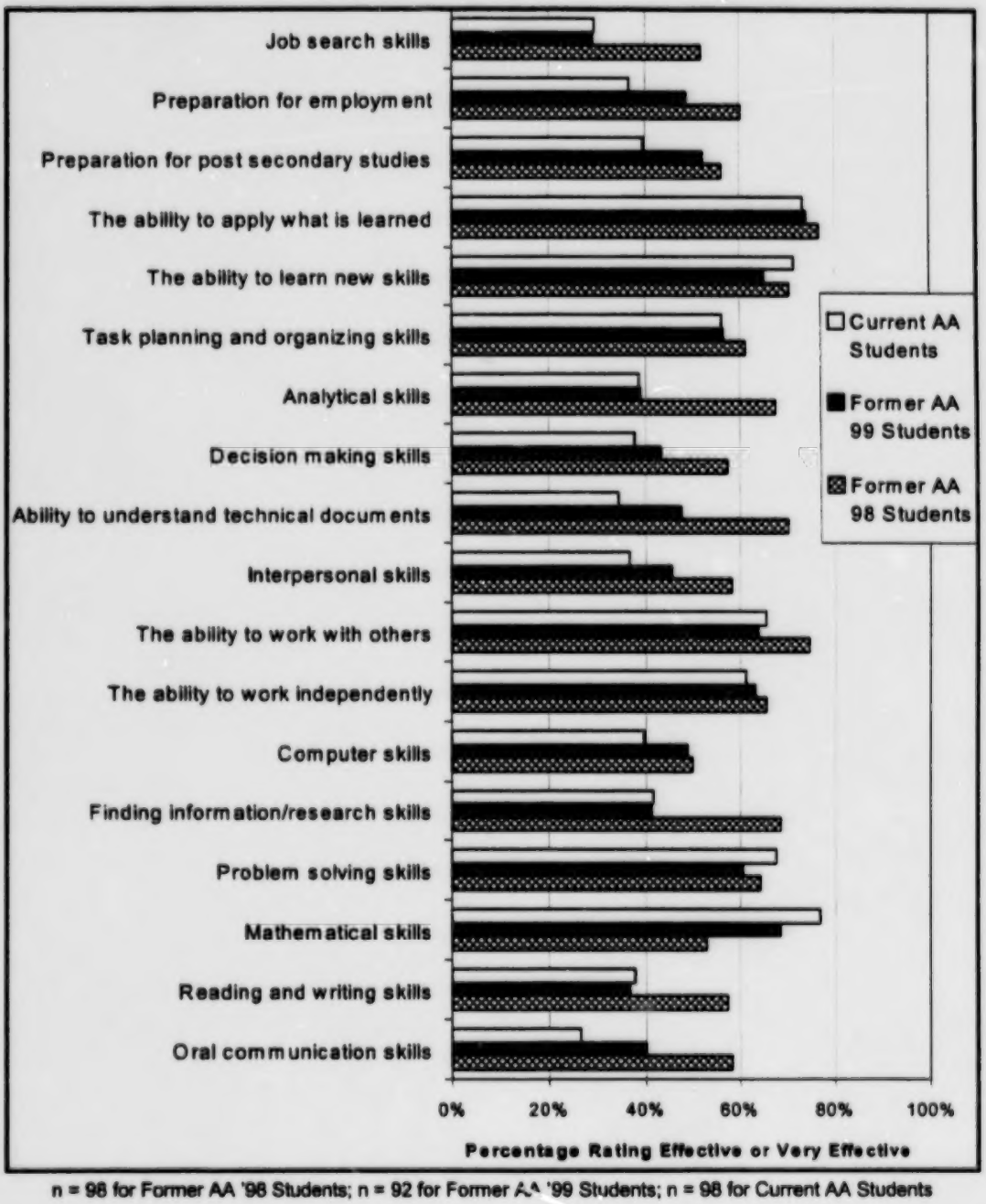
Across all three samples, there was agreement on five skills that were improved by taking Applied Academics. At least 60% of respondents in each group rated Applied Academics as effective or very effective in improving the following skills:

- problem solving skills;
- the ability to work independently;
- the ability to work with others;
- the ability to learn new skills; and
- the ability to apply what is learned.

Applied Academics courses were rated lowest for the development of job search skills. Only about 30% of Current and Former Applied Academics '99 students rated Applied Academics courses as effective or very effective in this regard.

Figure 3-2

Impact of Applied Academics on Employability Skill Development: Percentage Who Rated Applied Academics as Effective or Very Effective in Helping Improve Skills



n = 98 for Former AA '98 Students; n = 92 for Former AA '99 Students; n = 98 for Current AA Students

At least half of the respondents in the Applied Academics '98 former student sample rated Applied Academics as effective or very effective in improving every one of the skills listed in the question. At least two thirds of these respondents gave, in addition to the skills listed above, Applied Academics positive ratings of effectiveness for the following skills:

- finding information/research skills;
- the ability to work with others;
- the ability to understand technical documents;
- analytical skills;
- the ability to learn new skills, and
- the ability to apply what is learned.

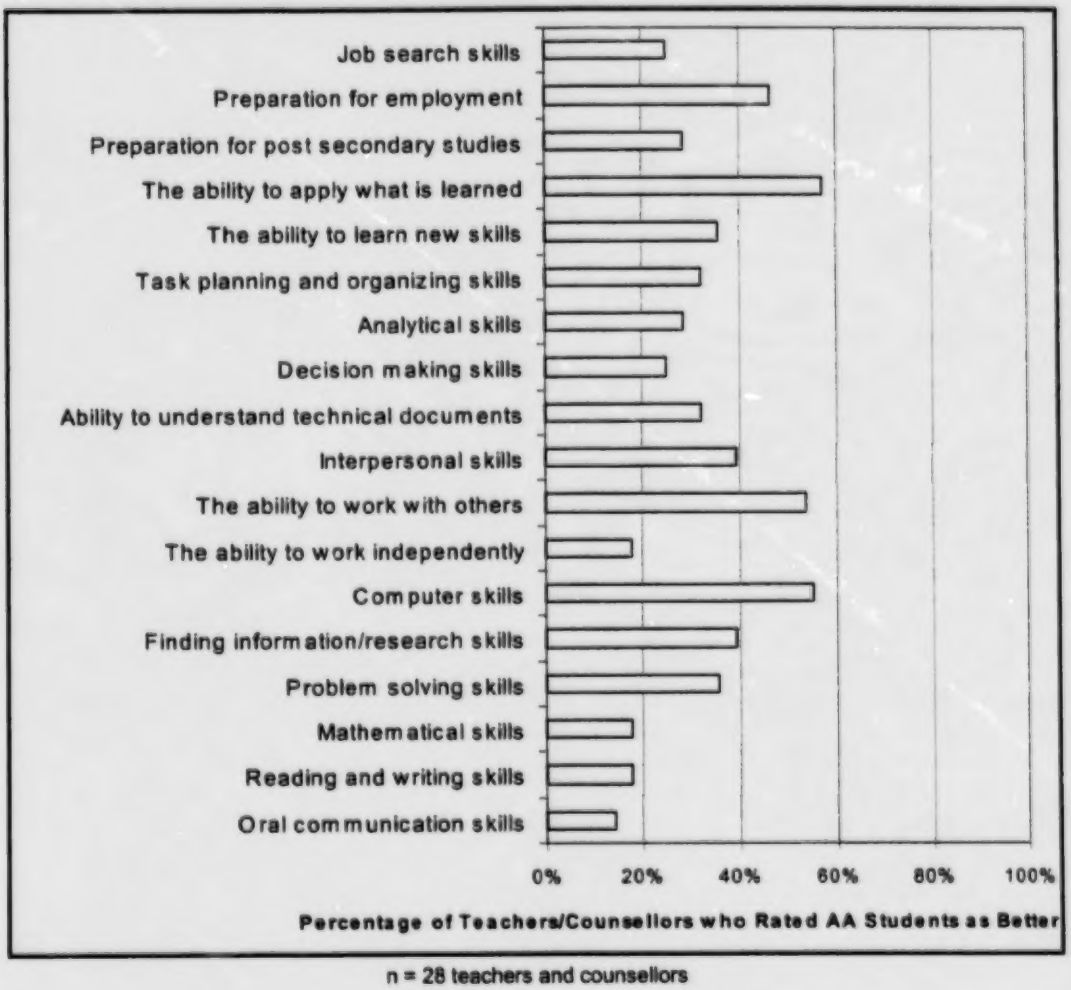
Respondents in the current Applied Academics student sample tended to have neutral views about the impact of Applied Academics on job search skills (41%), preparation for employment (40%), and preparation for post-secondary studies (42%), compared to 30% - 37% of the former '99 student sample, and 22% - 29% of the former Applied Academics '98 sample.

3.2.2 Perceptions of Teachers and Counsellors

Teachers and counsellors were asked to rate a number of specific employability skills in terms of how effective Applied Academics students were compared to other students in developing these skills. Figure 3-3 shows the percentage of classroom teachers and counsellors who gave a "more effective" or "much more effective" rating for each of these skills (28 out of 38 responded). Slightly less than half of the respondents rated Applied Academics as more effective in preparation for employment. At least half of the respondents agreed that Applied Academics were more effective than Non-Applied Academics in the development of: the ability to apply what is learned, computer skills, and the ability to work with others. About one-third rated Applied Academics as ineffective or very ineffective in preparing students for post-secondary employment, and in developing their analytical and mathematical skills. Between 29% and 46% rated Applied Academics students as "neutral" compared to other students in 10 of the 18 employability skills (e.g., job search 29%, mathematical skills 32%, decision making 43%, reading and writing 43%, and oral communication 46%).

Figure 3-3

Percentage of Teachers/Counsellors Who Rated Applied Academics Students as Better Than Other Students on Development of Various Employability Skills



n = 28 teachers and counsellors

3.3 Impact on Post-Secondary Education and Employment

Respondents in all four student groups (former '98 Non-AA and '98 AA, former AA '99, and current AA students) were asked to indicate whether specific courses they had completed had helped, or would help, them enter into post-secondary studies and/or employment. The Applied Academics '98 and Non-Applied Academics '98 former student samples were asked about the following subjects:

- Principles of Mathematics 11 or 12, or Applications of Mathematics 11 or 12;
- English 12 or Technical and Professional Communications 12;
- Information Technology 11 or 12; and
- Physics 11 or 12, or Applications of Physics 11 or 12.

The courses taken by the Non-Applied Academics former students were concentrated in three areas: Principles of Mathematics 11 or 12, and English 12. The courses taken by those in the Applied Academics '98 former student sample were concentrated in the Applications of Mathematics 11 and Technical and Professional Communications 12, as well as in English 12 and Principles of Mathematics 11.

The Applied Academics '99 former student sample and the current Applied Academics sample were asked about the following subjects:

- Applications of Mathematics 11 or 12
- Technical and Professional Communications 12
- Information Technology 11 or 12
- Applications of Physics 11 or 12

A majority of respondents in both the Applied Academics '98 former student sample, and the current '99 Applied Academics student sample had taken, or were taking, Applications of Mathematics 11 or 12. Some from both samples had taken Information Technology 11 or 12, but only three from the Applied Academics '99 former student sample had taken Technical and Professional Communications 12.

Few students in any of the four groups had taken Physics 11 or 12, and even fewer had taken Applications of Physics 11 or 12. The number of respondents in each group who reported having taken each course, is provided in the Technical Appendix.

Respondents gave open-ended answers which were coded as either positive (i.e., helpful), neutral, or negative (i.e., not helpful). Not all respondents answered this question, even if they had taken the course, and none provided information on how physics had helped, or would help them enter post-secondary studies or employment. The number and percentage of respondents in each group who gave a positive, neutral or negative response is provided in Tables 3-2 to 3-4, for Mathematics, Technical and Professional Communications or English, and Information Technology, respectively. However, caution must be used in interpreting the percentages, since the number of respondents who had taken some of these courses was very low.

Views on Mathematics are provided in Table 3-2. Respondents in the Non-Applied Academics '98 former student sample were rating Principles of Mathematics, and respondents in the Applied Academics '98 former student sample were rating either or both Principles of Mathematics and Applications of Mathematics. About two-thirds (68%) of the Non-Applied Academics group expressed positive views about how the Principles of Mathematics had helped them enter post-secondary studies or employment. The positive comments were largely about the usefulness of the information learned for work or in future studies. Only four had negative views, which tended to be about the difficulty of the course material.

Respondents in the Applied Academics '98 former student sample (45%) tended to have neutral views, 30% were positive and 25% were negative. Four stated that there had been no text book. Most of the other negative comments were about the difficulty of the subject.

Respondents in the Applied Academics '99 former student and the current Applied Academics samples rated only Applications of Mathematics. Almost two-thirds (63%) of the respondents in the Applied Academics '99 former student sample expressed positive views. Fourteen of these felt the Applications of Mathematics helped them to understand basic mathematics concepts. Six mentioned it would help them in business or employment. Six others mentioned that it helped because it gave them a credit for graduation, or raised their grade-point average. Only four mentioned that it would help them enter post-secondary studies. About a quarter (or 18 respondents) expressed negative views. Seven of those were negative because the university or college would not accept Applications of Mathematics as a credit.

Eighty-seven percent of respondents in the current Applied Academics sample expressed positive views about the course. Eleven of these felt Applications of Mathematics helped them to understand basic mathematical concepts. Nine others mentioned that it helped because it gave them credit for graduation, or raised their grade-point average. Eight felt it would help them enter post-secondary studies and five mentioned it would help them in business or employment, including one of those who also felt it would help enter post-secondary studies.

Table 3-2

How Mathematics Will, or Did, Help Respondents Enter Into Post-Secondary Studies or Employment: Responses were Coded as Positive (helpful), Neutral, or Negative (not helpful)

Sample	N	Positive		Neutral		Negative	
		n	%	n	%	n	%
Non-Applied Academics former students' Views on Principles of Mathematics	22	15	68%	3	14%	4	18%
Applied Academics '98 former students' Views on Principles of Mathematics and/or Applications of Mathematics	47	14	30%	21	45%	12	26%
Applied Academics '99 former students' Views on Applications of Mathematics	65	41	63%	6	9%	18	28%
Current Applied Academics students' Views on Applications of Mathematics	69	60	87%	3	4%	6	9%

Views on English or Technical and Professional Communications are provided in Table 3-3. Respondents in the Non-Applied Academics '98 former student sample were rating English, and respondents in the Applied Academics '98 former student sample were rating either, or both, English or Technical and Professional Communications. A little over half of the respondents (57%) in the Non-Applied Academics former student sample expressed positive views about English, and only four respondents expressed negative views. Nine mentioned that English was needed to enter post-secondary education, and nine others described the general benefits of good communication skills. Sixty percent of the respondents in the Applied Academics '98 former student sample gave positive opinions about the helpfulness of the English or the Technical and Professional Communications course they had taken, but their comments tended to be general in nature. Only four had negative views.

Respondents in the Applied Academics '99 former student and the current Applied Academics samples were only rating the Technical and Professional Communications 12 course. Two-thirds (68%) of respondents from the Applied Academics '99 former student sample had positive views about the course. Of these, six mentioned some aspect relevant to employment, four mentioned better general communication skills, three talked about learning computer applications and two indicated it would help them in post-secondary courses. Only three respondents had negative views. Only one of the current students expressed an opinion on the usefulness of the course; this opinion was positive.

Table 3-3

How Technical Communications (TPC) or English Will, or Did, Help Respondents Enter Into Post-Secondary Studies or Employment: Responses were Coded as Positive (helpful), Neutral, or Negative (not helpful)

Sample	N	Positive		Neutral		Negative	
		n	%	n	%	n	%
Non-Applied Academics former students' views on English	35	20	57%	11	31%	4	11%
Applied Academics '99 former students' views on English or TPC	35	21	60%	10	29%	4	11%
Applied Academics '99 former students' views on TPC	22	15	68%	4	18%	3	14%
Current Applied Academics students' views on TPC	1	1	100%	0	0%	0	0%

Views on Information Technology are provided in Table 3-4. All four groups were rating the same courses, Information Technology 11 or 12. All respondents who took these courses expressed positive views about them. Most of the comments pertained to the general usefulness of computers and the computer skills they learned.

Table 3-4

How Information Technology Will, or Did, Help Respondents Enter Into Post-Secondary Studies or Employment: Responses were Coded as Positive (helpful), Neutral, or Negative (not helpful)

Sample	N	Positive		Neutral		Negative	
		n	%	n	%	n	%
Non-Applied Academics '98 former students	7	7	100%	0	0	0	0
Applied Academics '98 former students	5	5	100%	0	0	0	0
Applied Academics '99 former students	16	16	100%	0	0	0	0
Current Applied Academics students	15	15	100%	0	0	0	0

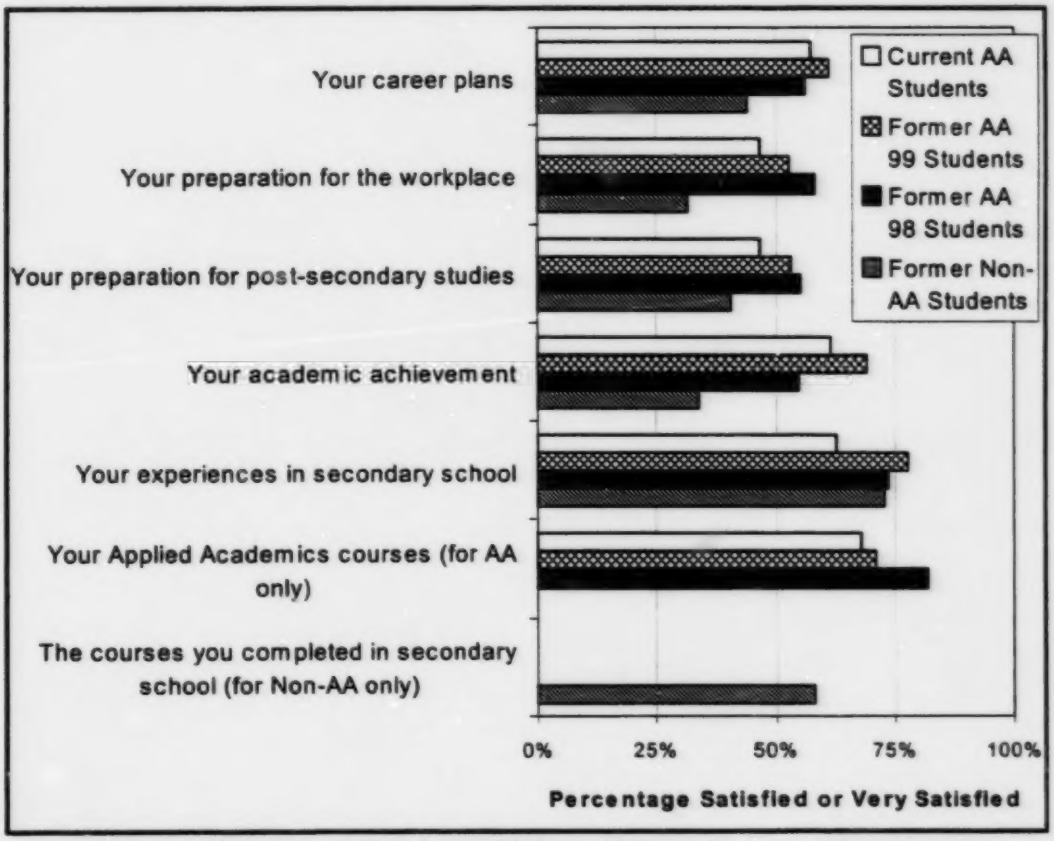
3.4 Students' and Former Students' Satisfaction with School

Respondents in all four student groups were asked to rate their level of satisfaction with various aspects of their school experience, using a five-point scale from very dissatisfied (a rating of 1), to very satisfied (a rating of 5). Respondents were asked to rate their satisfaction with:

- the courses they had completed in secondary school for Non-Applied Academics students, or the Applied Academics courses for Applied Academics students;
- their experiences in secondary school;
- their academic achievement;
- their preparation for post-secondary studies;
- their preparation for the workplace; and
- their career plans.

Figure 3-5

Satisfaction with High School for all Four Groups of Students and Former Students: Percentage of Respondents in Each Group Who were Satisfied or Very Satisfied



n = 88 Former '98 Non-AA; n = 98 for Former '98AA ; n = 93 Former '99 AA ; n = 96 for Current AA

Figure 3-5 shows the percentage of each group who were satisfied or very satisfied with each aspect of their school experience. For all aspects except experiences in secondary school, more Applied Academics students and former students were satisfied with their experiences in secondary school than compared to Non-Applied Academics former students.

About three-quarters of respondents in each group, except the current students, were satisfied or very satisfied with their experiences in secondary school; 63% of current students were satisfied or very satisfied. The current students were slightly more likely to give a neutral rating than were the others.

The Non-Applied Academics former students were less satisfied about the courses they had completed in high school and in their academic achievement, than were the Applied Academics current and former students. Of the Non-Applied Academics former student sample, 58% were satisfied or very satisfied, compared to 82%, 71% and 68% in the three Applied Academics samples. The Non-Applied Academics former students were also much less likely to be satisfied with their academic achievement than were the Applied Academics students; 34% of the Non-Applied Academics former student sample were satisfied or very satisfied, compared to 55%, 69%, and 61% in the three Applied Academics samples.

Compared to the Applied Academics students, the Non-Applied Academics former students were also less likely to be satisfied with their preparation for post-secondary studies or employment, or with their career plans. With respect to preparation for post-secondary studies, 41% of the Non-Applied Academics respondents were satisfied or very satisfied, and 19% were dissatisfied or very dissatisfied. This compares with 55%, 53%, and 47% in the three Applied Academics samples who were satisfied or very satisfied. The difference is even greater for views on preparation for the workplace. Thirty-two percent of the respondents in the Non-Applied Academics former student sample were satisfied or very satisfied, and 23% were dissatisfied or very dissatisfied, compared with 58%, 53%, and 47% in the three Applied Academics samples who were satisfied or very satisfied.

With regard to their career plans, 44% of the Non-Applied Academics respondents were satisfied or very satisfied, and 19% did not know. For the three Applied Academics samples, 56%, 61%, and 57% were satisfied or very satisfied with their career plans, and only 6% or less did not know in each case.

3.5 Parent/Guardian Satisfaction with Applied Academics

Parents/guardians of Applied Academics '98 former students were asked to identify the Applied Academics programs completed by their sons or daughters, and 41 responded. Course completions listed were 33 Applications of Mathematics 11/12, 7 Technical and Professional Communications 12, 5 Applications of Physics 11/12, and 6 Information Technology11/12. Four "don't knows" were reported.

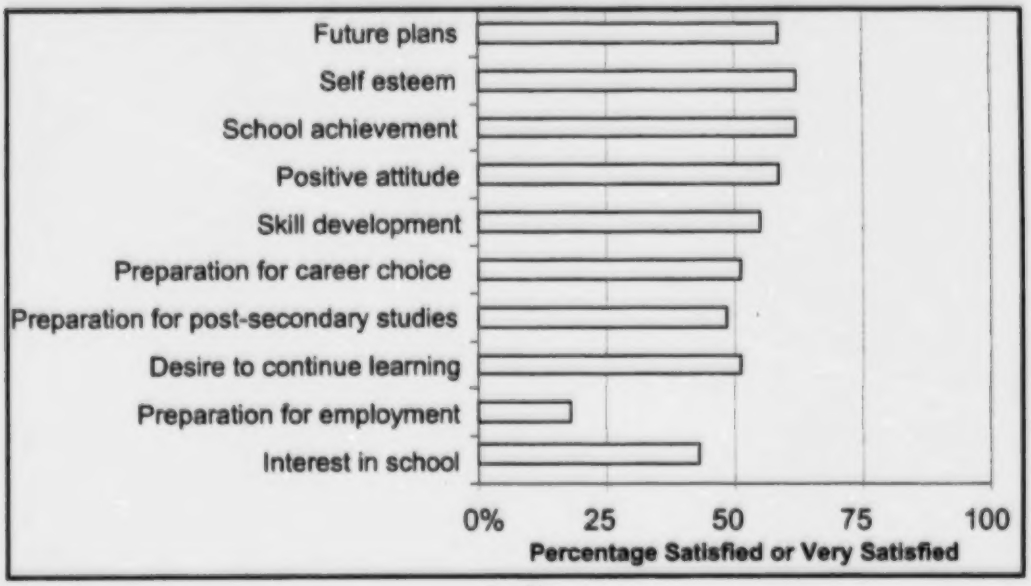
Parents/guardians reported what students were doing at the time of data collection. Note that some students may have been employed and attending an educational institution at the same time. Of the 54 activities students were engaged in, 10 were attending college, 9 were attending university, 3 were enrolled in a training program, and 1 was in an apprenticeship

program. In terms of employment, 13 were employed, 1 was unemployed, 2 were in volunteer work, and 15 were in a variety of other activities.

Parents/guardians were asked for their level of satisfaction with the impact of Applied Academics on their son's or daughter's educational experience. Figure 3-6 shows the percentage of parents who were satisfied or very satisfied with each aspect of their child's experience. At least half of the parents were satisfied with eight of the ten items being rated. The highest level of satisfaction was for impact on future plans, with 65% of parents satisfied. This is followed by self-esteem (63%), school achievement (61%), and positive attitude (59%). The lowest levels of satisfaction were reported for preparation for employment (44%) and interest in school (43%). Twenty-one percent of the parents were dissatisfied or very dissatisfied with preparation for employment.

Figure 3-6

Parent/Guardian Level of Satisfaction with the Impact of Applied Academics on Their Son's or Daughter's Educational Experience: Percentage Who Were Satisfied or Very Satisfied



n = 41

When parents/guardians were asked if they would recommend Applied Academics courses, 39 responded to the question. Of these, 25 were positive (yes, they would recommend AA courses), three were negative (no, they would not recommend AA courses), and eleven did not know.

4. Employment and Post-Secondary Outcomes

4.1 Employment Outcomes

The respondents in the Applied Academics '99 former student sample were asked to indicate what they had been doing since graduation or leaving school. Their responses are provided in Table 4-1. Note that each respondent could give more than one response.

Most of the respondents had left school less than six months prior to data collection. Half reported they were either attending college, university or a training institution, and one-third were working full-time. Another third were working part-time, and 16% were unemployed and looking for work. Students who did not respond either Yes or No were treated as responding No.

Table 4-1

Activities Since Leaving School of AA '99 Former Students

Activity	Percentage
Working full-time	32%
Working part-time	32%
Attending college	29%
Unemployed and looking for work	16%
Attending university	15%
Doing volunteer work	15%
Attending a training institution	6%

n = 93

Note: Multiple responses were counted

Both the Applied Academics '98 and the Non-Applied Academics '98 samples, who had been out of school longer, were asked more detailed questions about employment. They were asked what their employment situation had been during the last year, and what it was at the time of completing the survey. Table 4-2 presents the data on employment during the past year, and Table 4-3 gives the data on employment at the time of data collection.

More Applied Academics '98 former students than Non-Applied Academics former students (59% vs. 44%) had been employed full-time during the past year. About half of each group had worked part-time. A third of the Non-Applied Academics former students had worked at more than one job, compared to only 4% of Applied Academics '98 former students. Forty percent of the Non-Applied Academics former students had done volunteer work. None of the Applied Academics '98 former students reported doing volunteer work.

At the time of data collection, more Applied Academics '98 former students were employed full-time than were Non-Applied Academics former students (44% vs, 26%) and more Non-

Applied Academics former students were unemployed and looking for work than were Applied Academics former students (21% vs. 13%).

Table 4-2

Employment During the Past Year for Non-AA and AA '98 Former Students

	Non AA	AA '98
Working full-time	44%	59%
Working part-time	49%	50%
Working at more than one job	33%	4%
Doing volunteer work	40%	0%
Unemployed and looking for work	8%	0%
Unemployed and not looking for work	8%	0%

n = 89 Non-AA '98; n = 90 AA '98
Note: Multiple responses were counted

Table 4-3

Employment at the Time of Data Collection for the Non-AA and AA '98 Former Student Samples

	Non-AA	AA '98
Working full-time	26%	44%
Working part-time	34%	29%
Working at more than one job	9%	0%
Unemployed and looking for work	21%	13%
Unemployed and not looking for work	17%	7%
Doing volunteer work	9%	0%
In school	4%	2%
Other	7%	11%

n = 89 Non-AA '98; n = 98 AA '98
Note: Multiple responses were counted

Respondents who were working at the time of data collection, were asked about the type of work they were doing, and whether they were doing the work they had expected to do when they left secondary school. These results are presented in Tables 4-4 and 4-5 for both the Applied Academics '98 and the Non-Applied Academics samples. For comparison purposes, Table 4-4 also shows the career goals for the two groups.

The majority of respondents in both groups were not yet working in their chosen career. At least sixty percent were working in the service sector, although this is not the plan for most of them. In addition, more in both groups were working in trades than had planned. Although roughly a third planned to work in a profession, only one was doing so at the time of data collection. This is to be expected given that most respondents had been out of high school for less than a year and a half.

Table 4-4

Current Occupation Compared with Career Goals for Non-AA and AA '98 Former Students

	Non-AA		AA '98	
Career	Goals	Current	Goals	Current
Business	5%	4%	16%	6%
Trades	18%	29%	14%	28%
Profession	36%	0%	31%	1%
Service Sector	11%	65%	7%	61%
High Technology	6%	0%	10%	3%
Arts	9%	2%	9%	0%
Other	2%	0%	8%	1%
Don't Know	13%	0%	5%	0%

n = 87 Non-AA '98; n = 96 AA '98
Note: Multiple responses were counted

As shown in Table 4-5, 46% of Non-Applied Academics former student sample and 40% of Applied Academics '98 former student sample felt that their employment was what they had expected to do when they left secondary school. Although this may appear to contradict the previous finding that the majority were not yet working in their chosen career, it is likely that these respondents did not expect to be in the chosen career immediately after leaving high school.

Table 4-5

Employment Expectations for the Non-AA and AA '98 Former Student Samples: Response to the Question "Is your employment the type of work you expected to do when you left secondary school?"

	Non-AA	AA '98
Yes	48%	40%
No	46%	49%
Don't Know	6%	11%

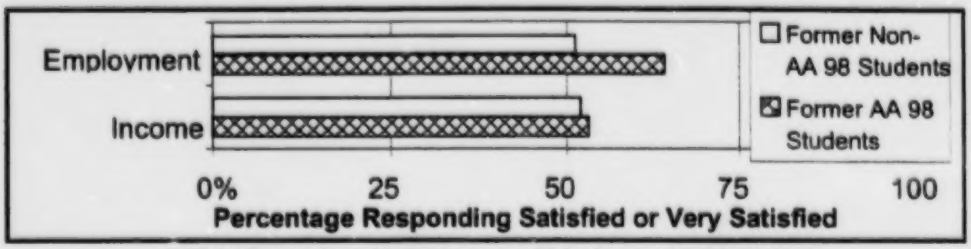
n = 52 Non-AA '98; n = 70 AA '98

Respondents who were working at the time of data collection, were also asked to rate their satisfaction with their employment and income. Figure 4-1 shows the percentage of former students who were satisfied or very satisfied with their employment, and with their income.

Over half (52%) of Non-Applied Academics '98 former students and about two-thirds (65%) of Applied Academics '98 former students were satisfied or very satisfied with their employment. Fifteen percent of respondents in the Non-Applied Academics '98 former student sample were dissatisfied, or very dissatisfied with their employment, compared to 8% of the respondents in the Applied Academic '98 former student sample. Over half (52%) of Non-Applied Academics '98 former students, and about the same percentage (55%) of Applied Academics '98 former students were satisfied or very satisfied with their income.

Figure 4-1

Satisfaction of Former Students with Employment and Income



n = 52 for Former Non-AA Students; n = 70 for Former AA '98 Students

As reported previously (in Table 4-3), 19 (21%) of Non-Applied Academics '98 and 13 (13%) of Applied Academics former students reported that they were looking for work at the time of data collection. These respondents were asked how long they had been seeking work, and whether they had been employed within the last year. They were also asked why they thought they were having difficulty finding work and whether they had plans to improve their employment prospects. Eleven of the Non-Applied Academics former students and eight of the Applied Academics former students reported that they had been employed within the last year.

Table 4-6 gives the number of months unemployed respondents reported that they spent looking for work. On average, Non-Applied Academics former students had spent more months looking for employment than had the Applied Academics former students. All 9 Applied Academics former students had been looking for less than six months, while 3 of the Non-Applied Academics former students had been looking for a year or more. Caution should be used in interpreting these results, as the number of respondents is very low.

Table 4-6

Number of Months Seeking Employment by Non-AA and AA '98 Former Students

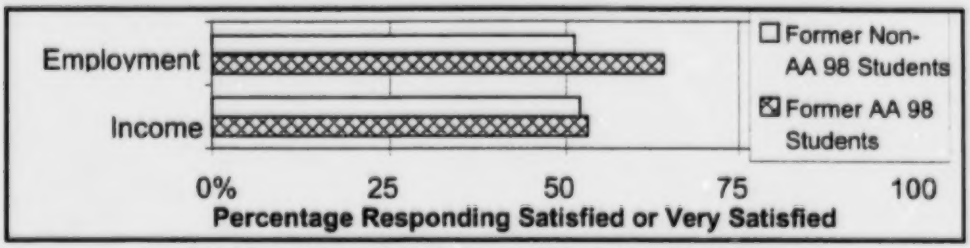
	Non-AA		AA '98	
	Number	%	Number	%
1 month or less	5	36%	4	44%
2 to 5 months	6	43%	5	56%
6 months to under 1 year	0	0%	0	0%
1 year or more	3	21%	0	0%
Average number of months	4.3		2.0	

Percentages were calculated out of the number who answered this question: 14 Non-AA and 9 AA '98.

Fifteen Non-Applied Academics former students and 10 Applied Academics former students answered the question about why they were having difficulty in finding employment. (Note, respondents could provide more than one reason.) The most frequently chosen reason for both the Non-Applied Academics and Applied Academics '98 former students who answered this question was the economy or lack of jobs (7 Non-AA respondents, 8 AA'98 respondents). Lack of experience (5 respondents) and not looking hard enough (5 respondents) were the next

Figure 4-1

Satisfaction of Former Students with Employment and Income



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most frequently selected reasons for the Non-Applied Academics former students, followed by lack of skills or training (3 respondents). The other most frequently chosen reasons for the Applied Academics former students were lack of skills or training (4 respondents), followed by discrimination (3 respondents), and lack of experience (2 respondents).

Eleven Non-Applied Academics former students who were unemployed reported that they had plans to improve their employment prospects. Of those, five were planning to get more education, two were planning to look more seriously, one was going to volunteer for work, one was enrolled in an employment program, and two others did not specify how. Eight of the Applied Academics former students who were unemployed reported that they had plans to improve their employment prospects. Of those, four were planning to get more education, two were planning to look more seriously, and two others did not specify how.

4.2 Post-Secondary Outcomes

The respondents in the Non-Applied Academics and Applied Academics '98 former student samples were asked questions about the education they had received since secondary school. The highest level of education they reported having completed is provided in Table 4-7. A higher proportion of Applied Academics respondents than Non-Applied Academics respondents reported having completed at least one year of post-secondary training.

Table 4-7

Highest Level of Education Completed by Non-AA and AA '98 Former Students

	Non-AA	AA '98
Grade 11	9.4%	4.3%
Grade 12	77.6%	58.5%
1st year of college	5.8%	13.9%
2nd year of college	1.2%	2.1%
Completed college	2.4%	0%
1st year of university or institute	2.4%	10.6%
2nd year of university	1.2%	0%
Other post-secondary training	0%	10.6%

n = 85 Non-AA '98; n = 94 AA '98

The types of education respondents had pursued since secondary school is provided in Table 4-8. Although respondents were asked to respond "yes" or "no" to indicate which type of education, if any, they had pursued, few responded in the negative, and only responded "yes" to the types of education they had pursued, leaving others blank. We do not know whether the ones who did not respond at all were ignoring the question, or did not answer because they had not pursued any education. Reported in the table are the number of respondents who gave an affirmative answer to each category, as well as the number who gave a negative answer to all categories. Percentages are also presented; these were calculated out of the total number of respondents in the group, whether or not they had responded to this question.

These percentages are accurate reflections of the sample, if the assumption is correct that those who did not respond have not pursued any education. This is a more conservative approach, since using percentages based only out of those who had responded would result in much higher percentages. This approach would only be accurate if all those who did not respond were similar to those who had responded in terms of the type of education they had pursued since leaving high school.

Sixty-three percent of the Non-Applied Academics '98 respondents and 66% of the Applied Academics '98 respondents reported that they had pursued some education since leaving school, including upgrading and continuing education. Twenty-nine percent of the Non-Applied Academics '98 former students and 39% of Applied Academics '98 former students had attended college since leaving school.

Table 4-8

Education Pursued Since Secondary School by Non-AA and AA '98 Former Students

	Non-AA		AA '98	
	Number	%	Number	%
Attended college	26	29%	38	39%
Attended university	8	9%	9	9%
Attended a technical institution	4	4%	7	8%
Attended a training institution	3	3%	6	6%
Upgrading Grade 12	4	4%	5	5%
Continuing Ed., night school, correspondence	8	9%	1	1%
Other	5	6%	0	0%
None	0	0%	17	17%
Number answering this question	56		82	
Number giving no response	33		16	

n = 89 Non-AA '98; n = 98 AA '98
Note: Multiple responses were counted

The types of education that respondents reported being enrolled in are provided in Table 4-9. Fifty-four percent of the Non-Applied Academics '98 respondents and 61% of the Applied Academics '98 respondents were enrolled in a course of study at the time of data collection. The largest proportion in each group were enrolled in college or university college (26% of the Non-Applied Academics '98 respondents and 38% of the Applied Academics '98 respondents).

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Table 4-9

Enrolment at Time of Data Collection for Non-AA and AA '98 Former Students

	Non-AA		AA '98	
	Number	%	Number	%
College	20	22%	34	35%
University/College	3	3%	3	3%
University	9	10%	5	5%
Technical school	2	2%	8	9%
Other	14	16%	10	10%
None	41	46%	31	32%
No Response	0	0%	7	7%

n = 89 Non-AA '98; n = 98 AA '98

Of those pursuing education and responding to the question "What are your courses leading to", a higher proportion of Applied Academics '98 former students than Non-Applied Academics '98 students reported that they were working toward a certificate (32% vs. 17%). A slightly lower proportion of Applied Academics '98 students, than Non-Applied Academics '98 students, were enrolled in a diploma program (30% vs. 33%). A higher proportion of Non-Applied Academics '98 respondents, than Applied Academics '98 respondents, were working towards a degree (40% vs. 21%). Seventeen percent of Applied Academics '98 students and 10% of Non-Applied Academics '98 students were completing other post-secondary studies.

5. Other Impacts of Applied Academics Programs

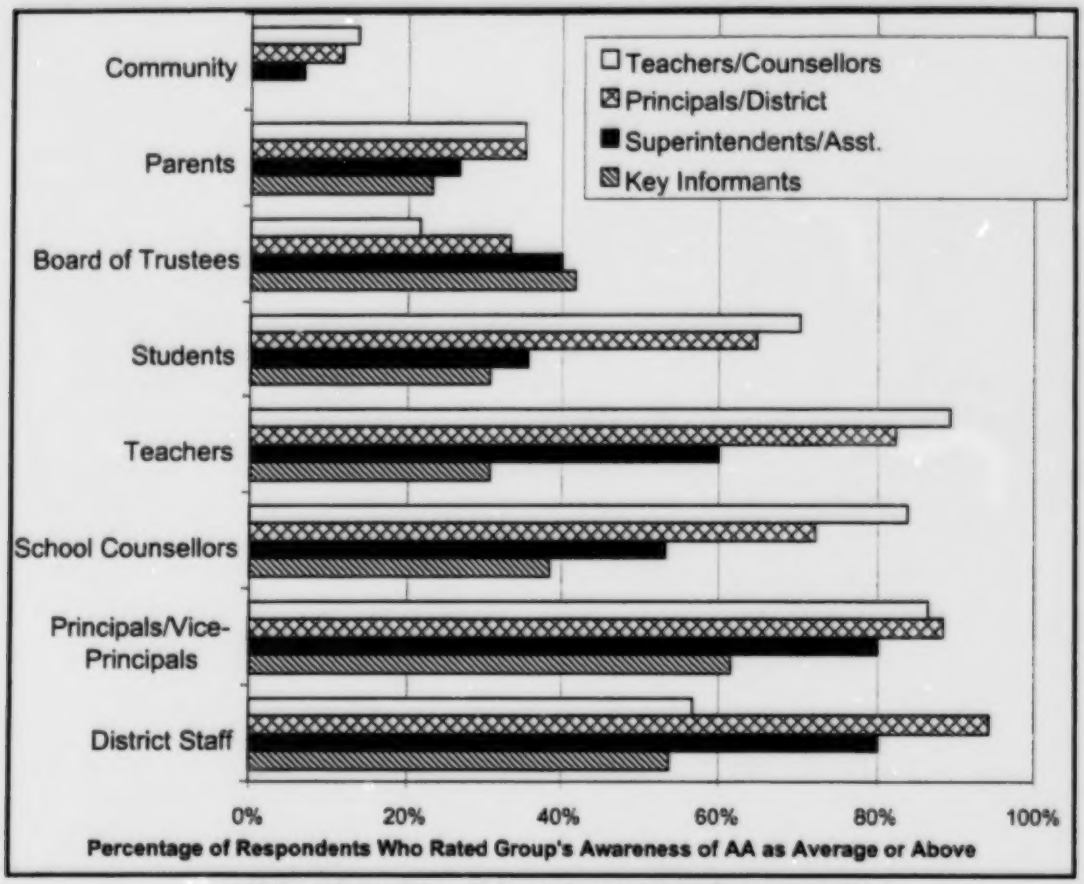
5.1 Program Awareness, Promotion and Support

One of the intended outcomes of program advocacy is the increased awareness and support of programs. Key informants, superintendents, principals/district coordinators and teachers were therefore asked, "In your opinion, what is the general level of awareness of Applied Academics demonstrated by the following groups in your school and/or district?" Using a five point rating scale where 1 is very low and 5 is very high, respondents rated the level of awareness, promotion and support of Applied Academics as demonstrated by various groups. The percentage of respondents who rated the group's awareness of Applied Academics as average or above is provided in Figure 5-1. Figure 5-2 shows the percentage of respondents who rated the group's level of promotion of Applied Academics as average or above, and Figure 5-3 shows the percentage of respondents who rated the group's level of support for Applied Academics as average or above.

Generally, key informants gave the lowest rating and teachers gave the highest rating for these groups. Under 15% of respondents rated the community as having average or above levels of awareness, and just over 20% of teachers and principals felt that the community demonstrated average or above levels of support for Applied Academics. With respect to parents, approximately 30% of the respondents rated parents as having average or above levels of awareness, under 20% for promotion of Applied Academics, and between 8% and 44% for support of Applied Academics. Responses varied (between 8% and 70%), on average or above, in ratings of students' levels of awareness and support, with promotion being somewhat less (between 17% and 41%). Respondents reported higher levels of awareness, promotion and support of Applied Academics among counsellors, principals, teachers and district staff than the other groups (community, parents, Board of Trustees and students). Overall, respondents reported higher levels of awareness and support among the groups than the promotion levels.

Figure 5-1

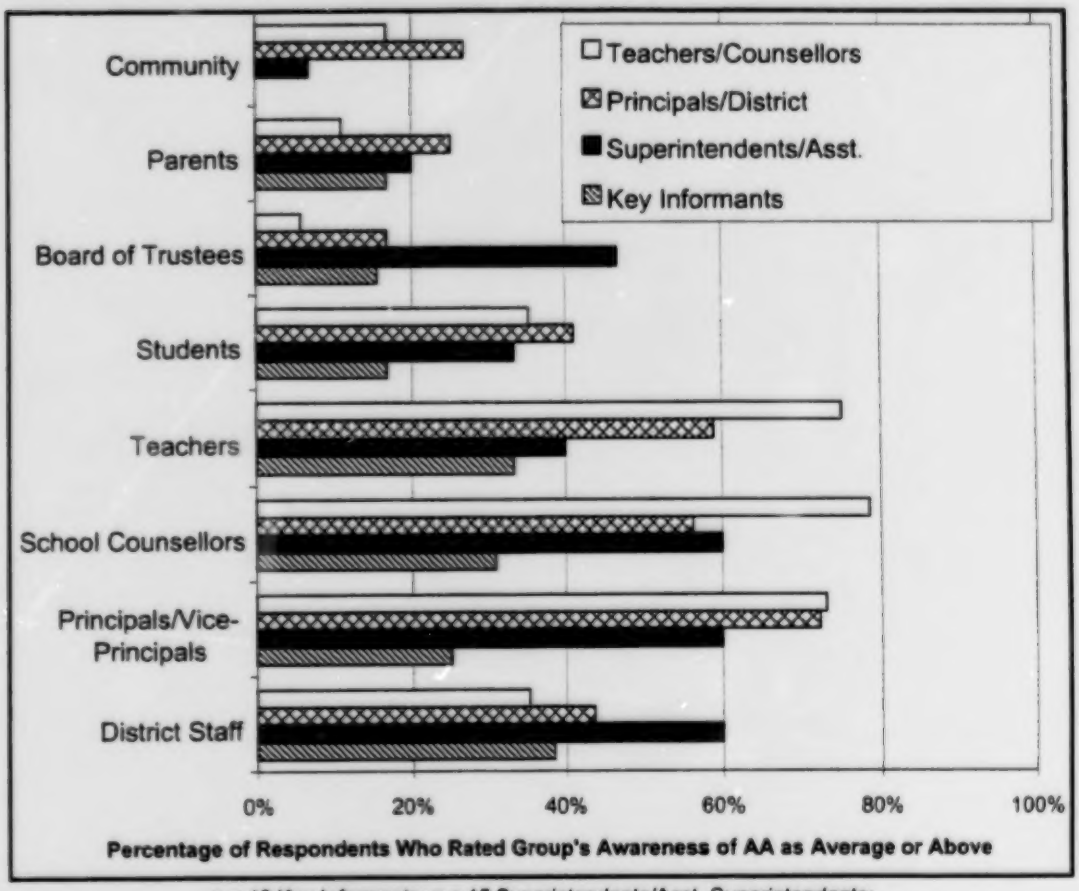
Respondents' Perceptions of Each Group's Level of Awareness of Applied Academics



n = 13 Key Informants; n = 15 Superintendents/Asst. Superintendents;
n = 18 Principals/District Coordinators; n = 37 Teachers/Counsellors

Figure 5-2

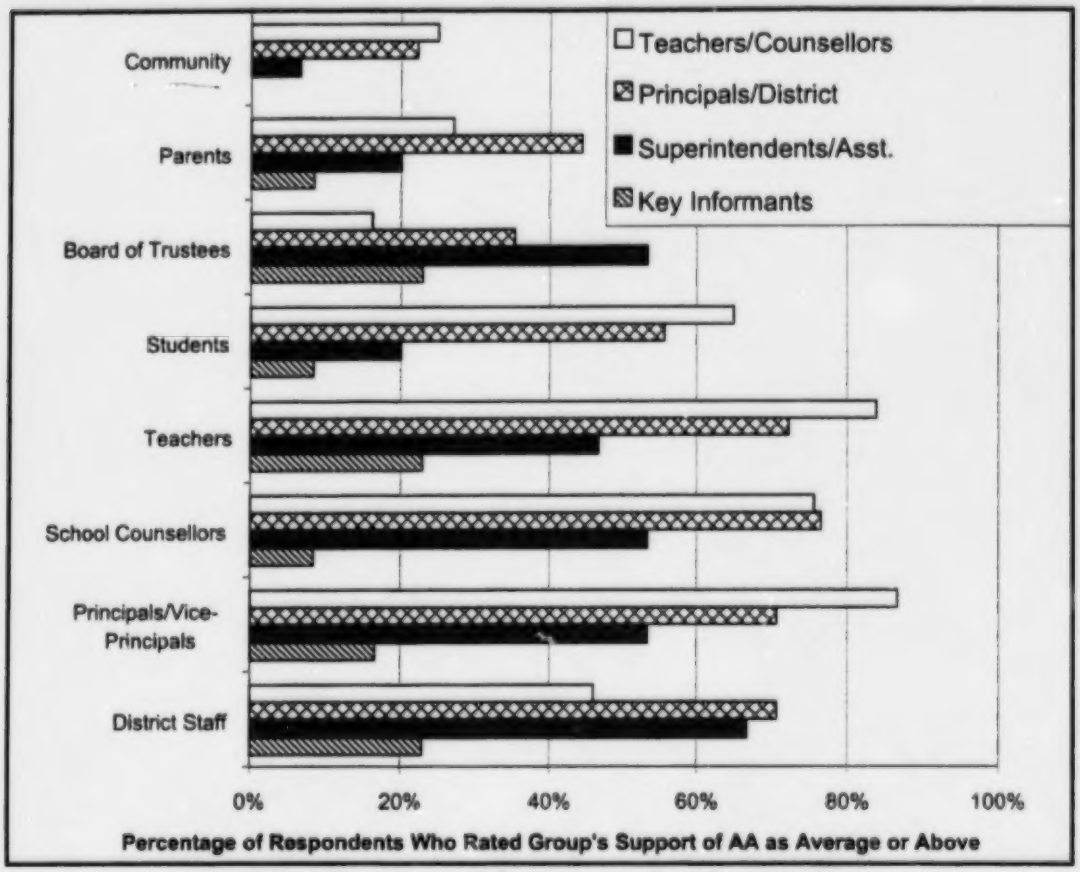
Respondents' Perceptions of Each Group's Level of Promotion of Applied Academics



n = 13 Key Informants; n = 15 Superintendents/Asst. Superintendents;
n = 18 Principals/District Coordinators; n = 37 Teachers/Counsellors

Figure 5-3

Respondents' Perceptions of Each Group's Level of Support for Applied Academics



n = 13 Key Informants; n = 15 Superintendents/Asst. Superintendents;
n = 18 Principals/District Coordinators; n = 37 Teachers/Counsellors

5.2 Impact of Applied Academics on Teaching Strategies

During new program implementation, there may be an impact on the instructional practices of other teachers. Teachers and principals were therefore asked whether there was an impact of Applied Academics on teaching strategies in other classrooms. Some examples of impact, such as the use of lab techniques, projects, "hands-on" activities, and application of learning to the real world, were included in the responses. Comments were categorized and a summary of the degree of impact provided in the responses is presented in Table 5-1. Given the low response from these two perspectives, (two principals and eleven teachers reported an impact on other classrooms, and six principals reported some impact), there is limited evidence of impact of Applied Academics on other classroom instruction at this time.

Table 5-1

Perception of Principals and Teachers of the Impact of Applied Academics on Teaching Strategies in other classrooms.

	Principals		Teachers	
	n	%	n	%
AA has had an impact	2/15	13%	11/28	39%
Some practical impact	6/15	40%	0/28	0%
No impact	3/15	20%	9/28	32%
Too soon to tell	1/15	7%	2/28	7%
Not sure	3/15	20%	6/28	21%

5.3 Overall Perception of the Impact of Applied Academics Programs

Table 5-2 presents the views of key informants, superintendents, principals and teachers on the overall impact of Applied Academics in their school and/or district. The greatest impact identified by teachers, (21 of 29 teachers or 72%) has been the impact on students. According to 24% of the respondents, the impact on the system is minimal. Where there are established programs, 6% of respondents consider that impact as significant. Fifty percent of the respondents indicate that there has been a positive impact on students or on schools with Applied Academics. Approximately 9% suggest that there has been some impact on the system and another 9% point that there is resistance by some educators and parents. Impact on the system was rated as minimum by 24% of the respondents.

Table 5-2

Views on Overall Impact of Applied Academics

	Key Informants	Superintendents	Principals	Teachers
# of Respondents	12 of 13	14 of 17	15 of 20	29 of 38
Positive impact on students	2	1	6	21
Positive impact on AA sites	1	1	2	0
Some impact on system	2	1	3	0
Minimum impact on system	5	6	2	4
Resistance raised	2	3	0	1
Too early to tell	0	1	1	2
Don't know	0	1	1	1

N = 70 respondents

5.4 Views on Implementation

5.4.1 What is Working Well?

Key informants, superintendents, principals and teachers were asked their opinions of what is working well in Applied Academics implementation. Comments from 66 educators (12 key informants, 15 superintendents, 16 principals and 23 teachers/counsellors) were categorized to report the findings in rank order. These are shown in Table 5-3. Teacher commitment is deemed highest in what is working well (26%), followed by Applications of Mathematics (20%), practical applications for students (18%), and leadership and support (17%).

Table 5-3

Educators' Opinions on What is Working Well in the Implementation of Applied Academics

Response Categories	Number	Percentage
Committed teachers	17	26%
Applications of Mathematics	13	20%
Practical applications for students	12	18%
Leadership and support	11	17%
Information Technology	9	14%
Resources	7	11%
Workshops	6	9%
Technical and Professional Communications	4	6%
Too early to tell	2	3%

n= 66 educators (key informants, superintendents, principals and teachers)
Note: Multiple responses were counted

5.4.2 Challenges For the Implementation of Applied Academics

Key informants, superintendents, principals and teachers, were asked, "What challenges currently face the success of Applied Academics?" Sixty-four respondents came forward with comments, which were categorized into five main topics. The most predominant one, challenges in the system, was identified by 81% percent of the respondents. Challenges in the system included leadership at all levels to support implementation; organizing more flexible timetables to accommodate programs and activities; providing more counselling services and assistance in student and program selection; and finally, developing appropriate provincial exams for Applied Academics courses.

The second main topic mentioned and supported by 75% of the respondents, was articulation with post-secondary institutions. This topic was also brought forward in focus groups with parents, teachers and students. The third most common topic mentioned by 63% of the respondents was resources for implementation, such as equipment, curriculum, textbooks and supplies.

Acceptance of Applied Academics by parents, students, teachers, administrators and the community was mentioned as a challenge by 44% of the respondents. Comments included the

view that Applied Academics courses are considered less academic than others and are not accepted by universities, therefore, they are not as accepted as the traditional courses. The challenge is to gain credibility. A further challenge felt by 34% of respondents was that of providing effective teacher pre-service and teacher in-service.

5.4.3 Support Needed for Applied Academics

Sixty-four educators and key informants provided suggestions for support needed to ensure success of Applied Academics programs. The suggestions are very parallel to the challenges, and, in fact, address many of them. Seventy-five percent of the respondents agreed that support was needed to deal with system barriers as identified in the previous section. Support in obtaining resources was identified by 63% of respondents, followed by in-service (48%), acceptance of the programs by everyone in the system (45%), and articulation with post-secondary institutions and universities (42%).

The relationship of these comments to other findings in the evaluation is significant. The process of implementing new programs is complex and places demands on the system and the support of people in the system. How that support should be developed and sustained, is seen as a major issue by survey respondents, focus groups and educators.

6. Impact of CFAA on Applied Academics

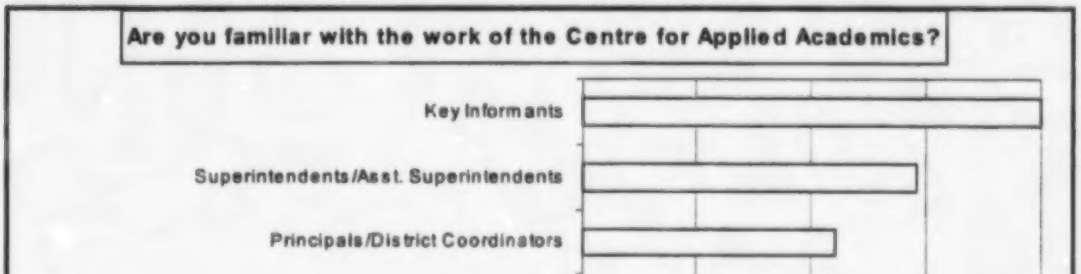
6.1 Promotion of Applied Academics

A significant role of the Centre for Applied Academics (CFAA) is to develop good relationships with districts and schools, to create awareness of Applied Academics and to perform an advocacy role for the promotion and development of Applied Academics. According to data received from CFAA, presentations were made at 24 conferences and workshops from July 1998 to November 1999. Of these presentations, 6 were in the Interior, 3 on Vancouver Island and 15 in the Lower Mainland. In addition, CFAA supported the establishment of an Applied Academics program demonstration site in an interior school district. Other promotional activities included developing and circulating brochures for parents and students, developing student oriented videos, sending out newsletters, developing a website and providing information and awareness sessions for teachers and administrators.

To determine the level of awareness of CFAA among educators and key informants, survey participants were asked if they were familiar with the work of the CFAA. Of the 88 respondents, 46 or just over 52%, said they are familiar with CFAA. All key informants were familiar with the role of CFAA; superintendents were more familiar than principals; and teachers were the least familiar with CFAA, as illustrated in Figure 6-1.

Figure 6-1

Percentage of Key Informants and Educators Familiar with CFAA



n= 13 key informants, 17 superintendents, 20 principals and 38 teachers

Survey participants were asked their opinion of the effectiveness of CFAA in facilitating good relationships and providing services and products to school districts. Effectiveness is depicted as a percentage of survey participants responding "effective" or "very effective", on a rating scale from 1 to 5, where 1 is very ineffective and 5 is very effective. Rating of these questions

varied and in some instances there were no answers to a specific part of the question. Only those who responded to the question were calculated into the percentages. The percentages of responses that rated performance as effective or very effective are depicted in Tables 6-1, 6-2, 6-3 and 6-5.

Table 6-1

Key Informants' and Educators' Ratings of CFAA Effectiveness in Developing Good Relationships, Creating Awareness and Promotion of Applied Academics

Advocacy Role of CFAA		Very Ineffective/ Ineffective		Average		Effective/ Very Effective		Don't Know	
	N	n	%	n	%	n	%	n	%
Developing good relationships	41	12	29%	5	12%	22	54%	2	5%
Creating awareness	41	7	17%	18	44%	13	32%	3	7%
Promoting Applied Academics	41	12	29%	10	24%	17	41%	2	5%

Table 6-1 shows that Key Informants' and educators' ratings of CFAA effectiveness in developing good relationships, creating awareness and promoting Applied Academics varied within the groups surveyed.

Key informants and educators familiar with CFAA rated CFAA's effectiveness in developing good relationships with districts and schools. Of the total responses, 67% of 12 key informants, 44% of 9 superintendents, 63% of 8 principals/district coordinators, and 42% of 12 teachers and counsellors rated CFAA as effective or very effective in developing good relationships.

CFAA's effectiveness in creating awareness of Applied Academics programs among educators, parents and students was rated as effective or very effective by 23% of 13 key informants, 33% of 9 superintendents, 63% of 8 principals/district coordinators , and 18% of 11 teachers/ counsellors.

Performing an advocacy role for the promotion and development of Applied Academics was rated as effective to very effective by 31% of 13 key informants, 56% of 9 superintendents, 50% of 8 principals/district coordinators, and 36% of 11 teachers/ counsellors.

6.2 Support for Program Implementation

Program implementation occurs at the classroom, school and district levels. Support for this implementation can come from a number of sources, but in general, implementation requires teacher in-service and appropriate implementation resources.

CFAA's mandate to develop and provide support material and services for implementation was carried out in several ways. Implementation support provided by CFAA included teacher in-service, developing and distributing implementation resources, providing information on the CFAA web-site and in the newsletter, and organizing a listserv.

According to interviews with CFAA staff, teacher in-service sessions were offered in the Lower Mainland, Fraser Valley, Vancouver Island, the Interior, Kootenays and Northern BC. Three annual Applied Academics Conferences were held.

Teacher in-service offered through the Applications of Working and Learning (AWAL), a project funded by Human Resources Canada and the Ministry of Education, is in its second year. This project assists teachers to recognize and identify employability skills, and provides opportunities for teachers to gain experience in the field to develop application-oriented activities that meet learning outcomes within their subject area. These projects are electronically available to other teachers.

Thirty AWAL workshops (10 in the interior, 3 on Vancouver Island and 17 in the Lower Mainland) were provided between May 1998 and August 1999. The March 31, 1999 Work Experience for Educators Final Report states that in 1998, 80 educators from 24 school districts participated in the AWAL project. The report also provides several pages of positive comments and suggestions for AWAL.

A number of start-up kits designed to assist teachers with implementation are under development by CFAA. Draft kits are presently available for Information Technology and for Technical and Professional Communications 12. In process of development are start-up kits for Applications of Mathematics 11 and 12. During the site visits, a few teachers who had accessed the kits said they were very helpful.

CFAA also developed a website that provides teachers and students with information, news and student activities. The web-based learning resources include Applications of Mathematics lessons, Technical and Professional Communications 12 lessons, Information Technology 11, units for Applications of Physics 11, employability skills, classroom activities and other relevant website addresses. This website has been very well received by teachers.

Table 6-2 reports the percentage of respondents who rated CFAA in facilitating teacher in-service, implementation resources and an informative and useful website. It is evident that the website received the highest rating of the three major activities in support of program implementation.

Table 6-2

Educator and Key Informants Ratings of CFAA in Developing and Providing Teacher In-Service, Implementation Resources, and an Informative Website

Implementation Support of CFAA		Very Ineffective/ Ineffective		Average		Effective/ Very Effective		Don't Know	
	N	n	%	n	%	n	%	n	%
Developing and providing in-service	41	11	26%	12	29%	17	40%	1	2%
Developing and providing resources	41	14	34%	9	22%	16	39%	2	5%
Developing an informative and useful website	41	5	12%	6	15%	25	61%	5	12%

6.3 Facilitating Student Transition Into the Workplace

Table 6-3 shows the percentage of all respondents familiar with CFAA, who rated CFAA as effective or very effective in facilitating student transition into the workplace. One third of superintendents (33%) and 38% of principals felt that CFAA was effective in facilitating student transitions into the workforce. Fewer teachers/counsellors (9%) and key informants (8%) gave CFAA a rating of effective or very effective.

Table 6-3

Percentage Rating CFAA as Effective or Very Effective In Facilitating Student Transition into the Workplace

Workplace transition support of CFAA		Very Ineffective/ Ineffective		Average		Effective/ Very Effective		Don't Know	
	N	n	%	n	%	n	%	n	%
Student Transition into the workplace	41	13	32%	10	24%	8	20%	10	24%

6.4 Facilitating Articulation of Applied Academics Courses

Post-secondary institutions offer a variety of educational and training programs. These include apprenticeship programs, career and technical programs, and vocational programs. Apprenticeship programs require trades training, on the job experience and classroom instruction. Career and technical programs provide specific training in a variety of fields, such as electronic engineering or business administration. Vocational programs have shorter training periods that lead to careers such as welding, mechanics and chef's training.

Academic or Professional Degree programs are offered at institutes and university colleges. Academic Programs are offered by universities, university colleges and the Open Learning Agency. University Transfer Programs are offered at various post-secondary institutions. Not all courses offered in the secondary school graduation program are accepted by each institution, so the process of articulation becomes a necessary part of transition to post-secondary studies. Student transition into post-secondary institutions is dependent upon meeting admission requirements for the institutions and the faculties students seek to enter.

The BC Council of Admissions and Transfer has a formal process for articulation between and among post-secondary institutions. Only recently, and for the first time, the secondary system was invited to participate on the Council.

The Secondary to Post-Secondary Transitions Team of the Centre for Curriculum, Transfer and Technology has prepared a resource book, *Enhancing Transitions*, to assist with articulation agreements between secondary and post-secondary institutions. Sixty-eight post-secondary articulation committees meet annually to negotiate articulation. A CFAA representative has attended various articulation meetings, which relate to Applied Academics programs.

Table 6-4 provides articulation information, which was published in 1998 and distributed to secondary schools. The table lists Applied Academics courses and the number of institutions that will accept the course for entry or will accept it, provided that specific criteria are met. The institutions are not listed here; the intention is to indicate the limited number of choices that Applied Academics students have available to them. For further detail, readers are advised to refer to the calendar or website of the receiving institutions.

Table 6-4

Articulation from Grade 12 Applied Academics Courses: Number of Institutions Accepting AA courses

Applied Academics Course	Vocational/Career Technical Programs		University Transfer, Associate Degree Programs and Indirect Transfers to Degree Programs	
	Degree Granting (out of 14)		**Degree Granting (out of 14)**	
Technical and Professional Communications 12	Admission to Institution Program Admission Placement Test	1 2 5	Admission to Institution Program Admission Placement Test Indirect	0 1 5 13
Information and Technology 12	Admission to Institution Program Admission	1 1	Indirect	3
Applications of Mathematics 12	Admission to Institution Program Admission	3 5	Admission to Institution Program Admission Placement Test Indirect	1 7 1 13
Applications of Physics	Admission to Institution Program Admission	2 5	Admission to Institution Program Admission Indirect	1 6 13
	Non-Degree Granting (out of 13)		**Non-Degree Granting (out of 13)**	
Technical and Professional Communications 12	Admission to Institution Program Admission Placement Test	6 3 5	Admission to Institution Program Admission Placement Test	1 1 4
Information and Technology	Admission to Institution Program Admission	4 2	Admission to Institution Program Admission	2 2
Applications of Mathematics	Admission to Institution Program Admission Placement Test	4 4 3	Program Admission Placement Test	6 2
Applications of Physics	Admission to Institution Program Admission	3 5	Admission to Institution Program Admission	1 4

Notes:

Admission to Institution: Course is acceptable for admission to the institution.

Program Admission: Course is acceptable for some programs, but not others.

Placement Test: Course is acceptable as a pre-requisite after successful placement test.

Indirect: Indirect transfer, needs a minimum number of university transferable courses.

Taken from the "Student Guide to Articulation of Applied Courses for Admission to Post-Secondary programs within British Columbia". Revised. Nov. 30, 1998. Published by CFAA in collaboration with the Ministry of Education.

There were 14 Degree Granting institutions and 13 Non Degree Granting institutions in B.C. at the time of the study.

6.4.1 Current Status of University Acceptance of Applied Academics Courses

BC university registrars' offices were contacted to ascertain the criteria used to determine why Applied Academics have not been articulated for entry into university. The response was that at the time of submission of a course for articulation, the course did not meet the requirements of the university. Courses can be re-submitted for consideration.

All four universities reported that they request department heads to review curriculum submitted by the Ministry or an institution. Recommendations from department heads are based on whether the course is provincially examinable and if it meets the rigor and expectations of the university. Recommendations are made to the Senate Admissions Committee, which makes the final decision. If the course meets the requirements of the university, the registrar's office is notified. In addition, students must achieve specific grade levels to meet entry requirements. Each university's response on Applied Academics courses which meet entry requirements is summarized below. Courses that have not been accepted for entry are not listed.

- University of British Columbia: Applied Physics 11 and 12 (Together, these courses meet both the Grade 11 Science requirement and the Physics 11 requirement.) These courses do not meet the requirement for Physics 12.

- University of Victoria: Applications of Mathematics 11 and 12 can be applied as credit for Principles of Mathematics 11, and Applications of Physics 11 and 12 are accepted for the Science 11 requirement. Information Technology 11 and 12 may be used for entry into humanities, social science or engineering as an optional subject, but not as a science.

- Simon Fraser University: Applications of Physics 11 and 12 could be used in place of Principles of Physics 11 for entry requirements.

- University of Northern British Columbia: English 12 is mandatory plus 3 accepted academic courses and one accepted optional course. As of February 1999, the following Applied Academics courses meet entry level requirement, subject to a 65% or greater average on the 5 courses required: Applications of Mathematics 12 and Technical and Professional Communications 12 are accepted as academic courses that meet entry requirements; Information Technology 12 is not accepted for entry but may be used as a fifth option.

6.4.2. Facilitating articulation of Applied Academics with post-secondary institutions.

Survey respondents, key informants and educators familiar with CFAA, were asked how effective CFAA had been in facilitating Applied Academics courses for entry into post-secondary institutions. Table 6-5 shows the percentage of all of the above respondents who rated CFAA as effective and very effective in facilitating articulation of Applied Academics courses.

Responses supporting effective facilitation were highest for the facilitation of courses with colleges and lowest for articulation with universities. A total of 38% of 13 key informants, 33% of 9 superintendents, 50% of 8 principals, and 45% of 11 teachers rated CFAA's facilitation of articulation with colleges as effective to very effective. CFAA's articulation

with universities was rated effective to very effective by 23% of 13 key informants, 0% of 9 superintendents, 13% of 8 principals and 27% of 11 teachers. Articulation with universities received the lowest effectiveness rating of all nine items that were used to rate CFAA effectiveness (see Tables 6-1, 6-2, 6-3 and 6-5).

Table 6-5

Educator and Key Informants Ratings of CFAA in Facilitating Articulation of Applied Academics Courses.

CFAA Facilitating Articulation of Applied Academics		Very Ineffective/ Ineffective		Average		Effective/ Very Effective		Don't Know	
	N	n	%	n	%	n	%	n	%
Articulation with colleges	41	12	29%	10	24%	17	41%	2	5%
Articulation with universities	41	22	54%	10	24%	7	17%	2	5%

6.4.3 Advantages and Disadvantages of Agency Administration

Key informants and educators were asked, "In your opinion, what are the advantages and disadvantages of having a non-government agency, such as the Centre for Applied Academics administer and facilitate Applied Academics programs?" The advantages were recorded as positive comments and the disadvantages were recorded as negative comments. Table 6-6 illustrates the number of positive and negative comments made by respondents familiar with CFFA.

Overall, 36% of the comments reflected that the major advantages of a non-government agency are freedom from government constraints, and the ability of an agency to be more responsive. Overall, 64% of the comments reflected that the major disadvantages of a non-government agency are that it is not an integral part of the system, and lacks the necessary influence to impact on policies and procedures. In general, the concept of an agency dealing with promotion and implementation of curriculum was not supported by the respondents.

Table 6-6

Number of Advantages and Disadvantages of Agency Administration

	Key Informants	Superintendents	Principals	Teachers
Positive	14	7	7	7
Negative	17	16	8	17

n = 13 key informants, 14 superintendents, 12 principals, 18 teachers

7. Summary of Findings and Conclusions

7.1 Key Findings and Conclusions

Key findings and conclusions of the Applied Academics Evaluation are presented below, under the following headings:

- Impact of Applied Academics on Students
- Implementation of Applied Academics
- Impact of Applied Academics on the System
- Impact of the Centre for Applied Academics (CFAA) on Applied Academics
- Future Directions of Applied Academics

7.1.1 Impact of Applied Academics on Students

Applied Academics has had a positive impact on student learning.

Applied Academics students responded very positively about their experiences and the impact on their transitions from school to post-secondary and employment. The majority (at least 60%) of Applied Academics students in the three Applied Academics student groups taken together, reported positive views on the learning activities, improved marks, understanding of course work, and how and where to apply what they learned.

Over half of the Applied Academics students, 51% of 94 current students, 60% of 89 graduates and early leavers '99, and 84% of 91 graduates and early leavers '98, reported that they would agree or strongly agree to recommend Applied Academics programs to other students. Over 60% of these students reported they had improved on their ability to apply what is learned and the ability to learn new skills. At least 60% also reported they improved on their problem solving skills and their ability to work independently and in teams.

Applied Academics had a positive impact on student transition to post-secondary education and employment.

The level of satisfaction with preparation for post-secondary education, employment, and career plans for Applied Academics students was generally higher than that for Non-Applied Academics students. In addition, more Applied Academics than Non-Applied Academics graduates and early leavers were working full-time and in post-secondary studies. The 1998 Applied Academics graduates and early leavers reported that 61% were enrolled in post-secondary studies and 44% were working full-time. This compares with 54% of Non-Applied Academics early leavers graduates who were enrolled in post-secondary studies and 26% who were working full-time.

Parents perceive positive impacts of Applied Academics on their child.

Parents' level of satisfaction with the impact of Applied Academics on their son or daughter was rated satisfied to very satisfied by between 43% and 65% of the respondents. Twenty-five of 39 parents surveyed (64%) reported that they would recommend Applied Academics, 11 parents (28%) reported don't know and three (7%) would not recommend Applied Academics.

Educators also perceive positive impacts of Applied Academics on students except for the transition to post-secondary institutions.

Between 40% and 64% of educators and key informants rated Applied Academics students better than other students with respect to school retention, competence in employability skills, and transition into the workplace. Only 23% to 30% felt that Applied Academics students were better or much better in making transitions to post-secondary institutions.

7.1.2 Implementation of Applied Academics

The degree of implementation of Applied Academics has increased from the 1996/97 school year to the 1998/99 school year, but implementation across the system is very limited, apart from Information Technology.

1998/99 Ministry data reported that students in 35 schools, in 21 school districts, had received credit for Applications of Mathematics 11 and/or 12, and/or Technical and Professional Communications 12. Based on provincial enrolment data, the percentage of Grade 11 and 12 students enrolled in Applied Academics, other than Information Technology, increased from 0.5% in 1997/98 to 1.2% in 1998/99. Information Technology, which overlapped with, and was intended to replace Computer Science, enrolled 9.8% in 1997/98 and increased to 10.6% in 1998/99.

Implementation barriers have affected program development.

Findings from respondents point to the lack of acceptance, equipment, resources, materials and in-service as challenges to the implementation of Applied Academics. System barriers that had affected Applied Academics implementation were identified as inflexible timetables, lack of assistance in counselling students, lack of credibility of Applied Academics courses, inappropriate provincial examinations and limited articulation with post-secondary institutions. One of the most prevalent barriers identified by all groups surveyed or interviewed was the lack of clear articulation of Applied Academics with the post-secondary institutions.

Early implementation projects have lacked the necessary resources, which may have limited program growth.

Textbooks, graphics calculators and manipulative materials were lacking for the implementation of Applications of Mathematics, as were equipment and materials for Applications of Physics. The transition from Computer Science to Information Technology was more effective due to access to equipment, trained teachers and no other competing courses. Technical and Professional Communications has been successfully implemented in the few schools that offer this program.

Any increase in enrolments will be dependent upon effective support.

Superintendents, principals and teachers felt that enrolments in Applied Academics would increase, if program acceptance and improved support were forthcoming. Opinions by educators on what is needed to support better implementation, include removing system barriers, having committed teachers, providing leadership support, providing more in-service and resources, and achieving full articulation with post-secondary institutions.

7.1.3 Impact of Applied Academics on the System

The overall awareness and level of acceptance of Applied Academics programs varied, but is generally low among certain groups.

Analysis of surveys and on-site visits reveal that the general levels of awareness, promotion and support of Applied Academics programs varies. Educators rated parents, Board of Trustees and the community as having a low to average of level of awareness of and promotional support for Applied Academics programs. They rated teachers, counsellors, principals, students and district staff at a higher level of awareness, promotion and support.

During focus group sessions, it was very evident that parents had limited awareness of Applied Academics in general and focused on specific subjects in the discussions. About half the students had received some encouragement to enrol in Applied Academics and a small number were discouraged from enrolling. The most frequent source of encouragement came from teachers and counsellors. The most frequent source of discouragement came from parents, other teachers and friends.

The primary impact of Applied Academics has been on Applied Academics students, rather than on the system.

Responding teachers' and principals' views on the impact of Applied Academics on teaching strategies in classrooms offering other courses varied. The impact of Applied Academics on other classrooms was seen as being limited to schools with Applied Academics programs. About 39% of 28 teacher respondents and 53% of 15 principal respondents agreed that there was an impact on instruction in schools that have Applied Academics programs. Approximately 28% of both groups reported either that it was too soon to tell or that they were not sure. Overall, the perception was that the impact of Applied Academics was highest on students in the Applied Academics programs, with little to minimum impact on the system.

7.1.4 Impact of the Centre for Applied Academics (CFAA) on Applied Academics

The effectiveness of Centre of Applied Academics in advocating for, and raising awareness of Applied Academics has been limited in the system.

Of 88 key informants and education respondents 52% had been familiar with the work of CFAA. Of those who were familiar, 54% rated CFAA as effective/very effective in developing good relationships; 41% felt that CFAA had been effective/very effective in its advocacy role; and 32% felt that CFAA was effective/very effective at creating awareness of Applied Academics.

The Centre of Applied Academics has had mixed success in supporting implementation.

Of 41 key informants and educators familiar with CFAA, 61% rated CFAA's development of a useful and informative website as effective/very effective and 12% had no opinion. In-servicing of teachers was rated effective or very effective by 40% of the key informants and educators familiar with CFAA. Although a majority of superintendents and principals thought that CFAA was effective in developing and providing teacher in-service, only a minority of teachers, counsellors and key informants felt this way. Less than half (39%) of respondents rated CFAA as effective in the development of implementation resources

Lack of full articulation with post-secondary institutions is seen as a barrier to program development.

Three-quarters of educators and key informants (n = 64) reported that lack of clear articulation was a barrier to student participation in Applied Academics. Parents in focus groups reiterated this as a concern and a problem. Applied Academics courses do not fully meet most university requirements for direct entrance into programs. Specific additional requirements for Applied Academics are stipulated to enter into university transfer and degree programs. Students report that accurate information is not readily accessible and sometimes information is misleading. The Centre's role in facilitating articulation with colleges was rated effective/very effective by 41% of key informants and educators familiar with CFAA, and facilitating articulation with universities was rated effective/very effective by 17% of key informants and educators familiar with CFAA.

There are more disadvantages than advantages of agency administration for Applied Academics.

Overall, approximately a third of educators and key informants (n = 57) commented that the major advantages of a non-government agency were freedom from political constraints and the ability of an agency to be more responsive. Overall, approximately two-thirds of respondents commented that the major disadvantages of a non-government ~~agency was that~~ it is not an integral part of the system and lacks the necessary influence on policy and implementation processes.

7.1.5 Future Directions of Applied Academics

There are a number of challenges and barriers that need to be addressed for the future success of Applied Academics programs.

A number of challenges face the success of Applied Academics. Most teachers, counsellors, principals and key informants identified challenges and barriers in the system. These include lack of supportive leadership, inflexible timetables, insufficient counselling services, inappropriate provincial examinations, lack of clear articulation with post-secondary institutions, inadequate resources for implementation, low program acceptance by parents and the system, and insufficient in-service. When asked to respond to the form of support needed for Applied Academics, three-quarters of respondents agreed that more support was needed to address the system challenges and barriers.

7.2 Overall Conclusions

Applied Academics programs have been successfully implemented in some schools and school districts resulting in positive outcomes for students. Examples of positive outcomes where programs have been implemented include student improvements in the following: academic achievement, skill development, ability to apply what is learned, preparation for entry into post-secondary studies and/or the workforce, and the desire to continue learning. In addition, Applied Academics was viewed as having a positive impact on student retention, student interest in learning, and student satisfaction levels.

Applied Academics, in these early stages of implementation, has made some impact on the system in terms of student enrolments, the number of schools offering the programs, and articulation. During site visits, it was noticed that the implementation of Applied Academics has increased some educators' awareness of the underlying principles which address learning styles, instructional strategies, and the application of learning.

Support for Applied Academics is somewhat limited due to lack of information on program outcomes, a perception that courses are academically inferior, lack of full acceptance by post-secondary institutions, constraints in the system, lack of resources, and effective communication, among others. Successful implementation has been achieved where there has been school and/or district leadership and support, and where teachers have been committed to the concept. Addressing the barriers and the implementation needs identified in this report can have a positive impact on future implementation.

If the demonstrated benefits of Applied Academics programs are to be passed on to more students, there is a need for the Ministry to provide the leadership and support for program implementation. The impact of a non-government agency, responsible for promotion and support of implementation of Applied Academics in the school system, has been limited to a few successful sites.

Some issues that an agency may find difficult to deal with include: setting provincial policies and procedures; establishing communication infrastructures with districts, schools and communities; developing curriculum; selecting and allocating resources; influencing provincial examinations; articulating provincial courses with post-secondary institutions; and, participating with certification bodies and organizations, such as the College of Teachers, professional educational associations and other ministries.

Nevertheless, if the Ministry chooses to assume responsibility for a number of these activities, it may still wish to allocate specific tasks to an agency to assist in the support required for Applied Academics. However, student successes and the positive experiences of school offering Applied Academics programs over the last few years can provide the basis for continued growth and success.

APPENDIX A: SELECTION OF STUDENT SAMPLES FOR THE APPLIED ACADEMICS EVALUATION

Selection of Student Samples for the Applied Academics Evaluation

Applied Academics Students

The following specifications address three groups of students who have taken Applied Academics courses: Current students enrolled in the 1999/00 school year, Graduates or Early Leavers from the 1998/99 cohort, and Graduates or Early Leavers from the 1997/98 cohort. The Graduate and Early Leaver groups were not chosen to be mutually exclusive, because there were too few participants in Applied Academics. Instead, all available students from these categories were selected (a "census"). Therefore, some overlap between the two groups does occur.

1. Current students from the 1999/00 cohort (370 students) - contacted directly through 14 schools that offered Applications of Mathematics 11 or 12 and/or Technical and Professional Communications 12:

    - All current students who had completed Applications of Mathematics 11.
    - All current students who had completed Technical and Professional Communications 12.

2. Applied Academics Graduates or Early Leavers from the 1998/99 cohort (400 students) contacted by mail:

    - All students (Graduates or Early Leavers) from the 1998/99 school year who completed Applications of Mathematics in either Grade 11 or 12, or both.
    - All students (Graduates or Early Leavers) from the 1998/99 school year who completed Technical and Professional Communications 12.

    "Early Leavers" are defined as:
    - Students registered in Grade 12 as of September 1998, and
    - Who have not attained a Dogwood as of June 1999.

3. Applied Academics Graduates or Early Leavers from the 1997/98 cohort (209 unique students, 76 students occurring in both 1997/98 and 1998/99) contacted by mail and telephone:

    - All students (Graduates or Early Leavers) from the 1997/98 school year who completed Applications of Mathematics in either Grade 11 or 12, or both.
    - All students (Graduates or Early Leavers) from the 1997/98 school year who completed Technical and Professional Communications 12.

    "Early Leavers" are defined as:
    - Students registered in Grade 12 as of September 1997, and
    - Who have not attained a Dogwood Diploma as of June 1998, and
    - Who are not in school (any grade) on September 30, 1998.

Non-Applied Academics Students

The following specifications address the group of students sampled from those who had not participated in any Applied Academics courses from the 1997/98 cohort. Some over-sampling occurs for participation in Mathematics or English due to students participating in both courses.

Non-Applied Academics students were selected to match Applied Academics students in terms of letter grade performance. Ideally, performance was to be compared on a range of courses attended by all students. In reality, very few courses were widely attended by all students. The most commonly attended courses were Socials 11 and English 11, and so matching was based on a composite of the average between these two scores. Non-Applied Academics students were then sampled so that percentages of students within each of these letter grade categories matched the percentages of Applied Academics students within the same letter grade category. For example, the percentage of Applied Academics students that received an "A" in English and/or Socials Studies 11 (using the composite score described above) was 8.2%. Therefore, out of the 90 students needed for the Non-Applied Academics 1997/1998 graduate sample who took English 12, seven students were selected (which is 8.2% of 90 and then rounded). The same procedure was then used for the rest of the groups and letter grades.

Number of Non-Applied Academic students targeted from the 1997/98 cohort - contacted by mail and telephone:

- 90 Graduates who did not participate in any Applied Academics courses, and who completed English 12.
- 90 Non-Graduates who did not participate in any Applied Academics courses, and who completed English 12. (Actual number selected: 271 of 360.)

- 90 Graduates who did not participate in any Applied Academics courses, and who completed Principles of Mathematics 11 and/or Principles of Mathematics 12.
- 90 Non-Graduates who did not participate in any Applied Academics courses, and who completed Principles of Mathematics 11 and/or Principles of Mathematics 12. (Actual number selected: 177 of 360.)

APPENDIX B: PROFILES AND DATA OF STUDENT RESPONDENT SAMPLES

Profiles of Student Respondent Samples

The survey began with a number of questions to develop profiles of the students in each of the respondent groups. Non-Applied Academics '98 former students were selected to be matched to Applied Academics '98 former students, as outlined earlier in *Appendix A*, so that a valid comparison could be made. The Non-Applied Academics group is described first in the tables to provide a basis for comparison with the Applied Academics samples. The following tables contain data regarding the information discussed in this student profile. The reader may wish to examine the content of each table in order to make a comparison of each group.

Table B-1: Gender Distribution for Each Sample
Table B-2: First Nations Distribution for Each Sample
Table B-3 School Status for Each Sample
Table B-4 Courses Taken or Enrolled In for Each Sample
Table B-5 Average Grades for Each Sample
Table B-6 Career Goals for Each Sample
Table B-7 Plans for the Future for Each Sample

One of the key differences between the Applied Academics '98 and the other three samples (Non-Applied Academics '98 former students, Applied Academics '99 former students and current Applied Academics students) is the gender distribution. The distribution was more evenly balanced between males and females for both the '99 former student and the current student samples, than it was in the '98 Applied Academics sample.

Table B-1

Gender Distribution for Each Sample

Gender	Non-AA '98		AA '98		AA '99		Current AA	
	n	%	n	%	n	%	n	%
Male	42	47%	72	73%	38	41%	55	55%
Female	47	53%	26	27%	54	58%	45	45%
No response	0	0%	0	0%	1	1%	0	0%
Total	89	100%	98	100%	93	100%	100	100%

The proportion of First Nations students was larger (6%) in the Applied Academics '99 former student and in the Applied Academics current student samples (13%) than 1% in the '98 Applied Academics sample.

Table B-2

First Nations Distribution for Each Sample

First Nation	Non-AA '98		AA '98		AA '99		Current AA	
	n	%	n	%	n	%	n	%
Yes	1	1%	1	1%	6	6%	13	13%
No	88	99%	97	99%	85	91%	84	84%
Don't know/No response	0	0%	0	0%	2	2%	3	3%
Total	89	100%	98	100%	93	100%	100	100%

The typical youth in the Non-Applied Academics '98 former student sample was a former high school student who usually had received a C to a C+ average in high school and planned to attend college after graduation. About a quarter had left high school before graduating. At least three quarters of the sample had taken Grade 11 Math and Grade 12 English. Their career goals varied, but over a third planned to enter a profession. The most common influence on choice of career goals was parents and teachers, although only about 20% reported either as an influence.

Table B-3

School Status for Each Sample

School Status	Non-AA '98		AA '98		AA '99		Current AA	
	n	%	n	%	n	%	n	%
High school graduate	64	72%	87	89%	89	96%	2	2%
Early leaver	25	28%	11	11%	1	1%	0	0%
Grade 12 student	0	0%	0	0%	3	3%	84	84%
Other/no response	0	0%	0	0%	0	0%	14	14%
Total	89	100%	98	100%	93	100%	100	100%

The responses from the three Applied Academics groups ('98 former students, '99 former students and current students) were similar, in that the typical Applied Academics student, in all three samples, reported an average grade in the C+ to B range, and was more likely to have taken Applications of Mathematics rather than Principles of Mathematics. The Non-Applied Academics '98 former students, compared to the Applied Academics '98 former students, were more likely to have completed high school, and the Applied Academics '99 former students were more likely than the Applied Academics '98 former students to have completed high school.

Table B-4

Courses Taken or Enrolled In for Each Sample

Courses Taken	Non-AA '98		AA '98		AA '99		Current AA	
	n	%	n	%	n	%	n	%
Applications of Math 11	1	1%	74	76%	65	68%	81	81%
Applications of Math 12	0	0%	28	29%	15	16%	33	33%
Information Technology 11	16	18%	21	21%	17	18%	17	17%
Application of Physics 11	1	1%	7	7%	4	4%	1	1%
Application of Physics 12	1	1%	2	2%	0	0%	0	0%
Technical and Professional Communications 12	1	1%	34	35%	25	26%	3	3%
Principles of Math 11	64	72%	20	20%	30	32%	12	12%
Principles of Math 12	21	24%	13	13%	19	20%	2	2%
Information Technology 12	9	10%	9	9%	5	5%	12	12%
Physics 11	14	16%	18	18%	16	17%	6	6%
Physics 12	6	7%	10	10%	7	7%	0	0%
English 12	78	88%	62	63%	68	72%	44	44%
Total respondents	89	100%	98	100%	93	100%	100	100%

Note: Multiple responses were counted

Table B-5

Average Grades for Each Sample

Average Grade	Non-AA '98		AA '98		AA '99		Current AA	
	n	%	n	%	n	%	n	%
A	5	6%	12	12%	10	11%	6	6%
B	24	27%	39	40%	42	45%	37	37%
C+	30	34%	31	32%	35	38%	34	34%
C	29	32%	15	15%	6	6%	21	21%
C-	0	0%	1	1%	0	0%	1	1%
Other/no response	1	1%	0	0%	0	0%	1	1%
Total	89	100%	98	100%	93	100%	100	100%

The typical student in either of the Applied Academics '99 former student and the current student samples was more likely to plan to work or to complete a university degree than were students in either of the Non-Applied Academics '98 former student sample or the Applied Academics '98 former student sample. More of the '99 former Applied Academics students and current Applied Academics students were interested in a career in the trades, and less were interested in a profession, high technology or in business, than were the former students in the Applied Academics '98 former student sample.

Table B-6

Career Goals for Each Sample

Career Goals	Non-AA '98		AA '98		AA '99		Current AA	
	n	%	n	%	n	%	n	%
Business	4	4%	15	15%	8	9%	6	6%
Trades	16	18%	14	14%	20	22%	18	18%
Profession	31	35%	30	31%	21	23%	22	22%
Service Sector	10	11%	7	7%	8	9%	4	4%
High Technology	5	6%	10	10%	5	5%	4	4%
Arts	8	9%	9	9%	6	6%	8	8%
Other	2	2%	7	7%	16	17%	14	14%
Don't Know/No Response	13	15%	6	6%	9	10%	24	24%
Total	89	100%	98	100%	93	100%	100	100%

Note: Multiple responses were counted

Table B-7 shows that the post-graduation plans for the youth in the Applied Academics '98 former student sample were more varied than were those of the Non-Applied Academics '98 former students of which 80% planned to attend college. Applied Academics '98 former students were less likely to plan to attend college (57% vs. 80%) and were more likely to plan to attend university (26% vs. 21%) than Non-Applied Academics '98 former students. Parents and teachers were the most commonly reported influences on career choices.

Table B-7

Plans for the Future for Each Sample

Plans	Non-AA '98		AA '98		AA '99		Current AA	
	n	%	n	%	n	%	n	%
Graduate from Grade 12	19	21%	5	5%	8	9%	71	71%
Attend college	71	80%	56	57%	40	43%	56	56%
Complete university degree	19	21%	25	26%	38	41%	30	30%
Complete post-graduate degree	0	0%	1	1%	8	9%	11	11%
Complete job training program	3	3%	1	1%	8	9%	7	7%
Complete an apprenticeship	5	6%	14	14%	14	15%	16	16%
Work at job	13	15%	8	8%	41	44%	56	56%
Other/No Response	8	9%	28	29%	12	13%	1	1%
Total	89	100%	98	100%	93	100%	100	100%

Note: Multiple responses were counted

Students in either the Applied Academics '99 former student and the current Applied Academics student samples were much more likely to report that their parents influenced their career choice than were students from the previous year. They were also more likely to report being influenced by relatives, family friends, a teacher, a career counsellor, other students and the internet than were the students in the Applied Academics '98 former student sample.

APPENDIX C: CASE STUDIES (2)

APPLIED ACADEMICS PROGRAM CASE STUDY No. 1

Location: Interior Region

Focus

The case study focuses primarily on the Applications of Mathematics 11 and 12.

Enrolments

The school has 302 students enrolled in Grade 10, 290 in Grade 11, and 376 in Grade 12, with an overall enrolment of 1050 full-time student equivalents. Included in this enrolment are 55 part-time adult graduates completing a Grade 13 upgrading program.

The Applications of Mathematics 11 has 47 students (16.2%) enrolled in the current 1999/2000 school year. Principles of Mathematics 11 has 174 students (60%) enrolled and Principles of Mathematics 12 has 119 students (31.6%) enrolled. In addition, Calculus 12 has 30 students (7.9%) enrolled. The school also provides Applications of Mathematics 10 for 88 students (29.1%) and Principles of Mathematics 10 for 131 students (43.4%), thereby building continuity for students. The school does not offer Applications of Mathematics 12.

Fifteen students are enrolled in Technical and Professional Communications 12, 263 students in English 12, and 29 students in Communications 12. A total of 307 students are enrolled in these courses. Technical and Professional Communications 12 represents 4.8% of the Grade 12 enrolments in English.

Information Technology enrolled 55 students in Grade 11 and 24 students in Grade 12, representing 11.8% of the Grade 11 and 12 enrolment. In addition to Information Technology, a number of computer related courses that integrate learning outcomes from Information Technology, are offered in the school. These courses, Computer Animation, Business Education, and Desktop Publishing resulted in a total enrolment of 450 students, representing 42.8% of all students in the school. The school does not offer Applications of Physics 11 and 12 due to a lack of resources and student interest

Program Implementation

In 1996-97, the Centre for Applied Academics provided a grant to enable the school to become an innovator site for Applied Academics programs. The school has continued to work on the expansion of Applied Academics programs and is promoting the growth to support students in Applications of Mathematics, Technical and Professional Communications and Information Technology.

Next year, in partnership with BCIT and CISCO (Computer Information Systems Company), the school will be offering a number of new, technically oriented courses. The school plans to offer BCIT Aircraft Structures, BCIT Power Equipment, BCIT Electronics Technician, CISCO Hardware Technician, Electronics, Power and Transportation, Secondary School Apprenticeship, Career Preparation Programs and all of the Industrial Education Programs. In addition, the school intends to support these programs by encouraging students to enrol in the Applications of Mathematics and Technical and Professional Communications courses.

In the last few years, the school reported that it has been struggling in some areas of Applications of Mathematics, but the addition of new teachers has provided an opportunity to expand the programs. The main reason the school gave for not offering Applications of Mathematics 12 is that the Provincial exam does not match the pedagogy and intent of Applied Academics. A second reason is that the lack of necessary learning resources hindered implementation. At the present time, Applications of Mathematics textbooks are being field tested, so texts are still under preparation. Staff also mentioned that the lack of equipment, such as graphing calculators, added to the difficulties of implementation. However, staff predicts program growth because the Applications of Mathematics courses are supported well by the feeder schools and many of the implementation issues are being solved.

Technical and Professional Communications 12 (TPC 12) was implemented in 1997, and has continued to have one class in operation. According to the staff, the course is considered to be complex and demanding in terms of teacher time. During classroom observations and teacher and student interviews, the researcher found that students enrolled in Technical and Professional Communications 12 were very positive about the course, and were actively engaged in the activities. Teachers interviewed felt that English teachers are not supportive of TPC 12 because the course is not literature based and does not meet post-secondary entry level requirements. However, the students and teachers deem the course as relevant and meaningful and, as a result, the school administrator reported that the school intends to encourage enrolment in this course.

Over the next few years, the school administrator predicts that numbers will grow in all areas of Applied Academics as students, parents and teachers see the connection between applied courses, other programs in the school, and student transitions to post-secondary education and the workplace.

Staffing and District Responsibilities

The school district employs one coordinator with responsibilities for Career Programs and Applied Academics Programs. During interviews with district senior staff it was evident that they clearly supported Applied Academics programs. The administrators responsible for program development and direction at the school, reported they felt strongly that the growth and development of Applied Academics is crucial to the success of students in other programs at the school.

It is also felt by a number of district staff, administration, and teachers interviewed, that Applied Academics better meets the educational needs, in general, for a large majority of students.

The school and district are working towards a more useful, competency-based, application of mathematics to problem solving in real life situations, for all students. During the site visit, it was evident from observations and discussions with district and school administration, that they had developed an implementation approach to Applied Academics. They reported that this means fundamentally changing teaching strategies, having appropriate resources, and examining the learning outcomes in the applied courses. The district has also established a mathematics committee to review the current situation of mathematics implementation in the district, and the Provincial introduction of the Western Canada Protocols into curriculum over the next three years.

The school operates on a quarter system and, due to the addition of new courses, the administration is planning to make timetable adjustments for the next year. The school and district have made a commitment to Applied Academics programs and are working towards integrating the knowledge, skills, and attitudes developed by students, into career and post-secondary opportunities.

APPLIED ACADEMICS PROGRAMS CASE STUDY No. 2

Location: Fraser Valley

Focus

The case study focuses primarily on the Applications of Mathematics 11 and 12. This school does not offer Technical and Professional Communications12, however the study will provide some staff comments on this course.

Enrolments

School enrolment includes Grades 10, 11 and 12, with an overall enrollment of 1139 full-time equivalent students, or 1158, counting the part-time students in the current 1999/2000 school year. School enrolments in Grade 11 are 353 students and 359 in Grade 12. The school has 127 students (35.9%) enrolled in Applications of Mathematics 11 and 208 students (58.9%) in Principles of Mathematics 11. There are 109 Grade 12 students (30%) enrolled in Principles of Mathematics12, and 40 students (11%) enrolled in Calculus 12. The Applications of Mathematics 12 course was not offered due to some problems encountered with the Applications of Mathematics 12 Provincial exam. Teachers at this site felt that the exam did not reflect the learning outcomes and was too much like the Principles of Mathematics 12 exam.

Program Implementation

The Grade 11 Applications of Mathematics curriculum was released for pilot implementation in 1996. This school implemented Applications of Mathematics 11 in 1998-99. At the time, the start-up kit being developed by CFAA was not available, nor were the requested course outlines. Two teachers teach almost all of the Grade 11 Mathematics students. Together they share preparation time and plan parallel tests for the applied and academic students. The teachers and students are also involved in testing the Applications of Mathematics 11 textbook, which is currently under development. The developer offers workshops for participating teachers and provides feedback to the teachers and students that are testing the textbook.

School staff identified several issues regarding the implementation of Applications of Mathematics. Some concern was expressed about inconsistent information being provided by the Ministry and the CFAA on Applied Academics courses and resources. Specific concerns were raised about the lack of equipment and resources required for implementation, such as lab equipment, graphics calculators, and current information and textbooks for application units. Also, the staff reported that CFAA provided little support to this school in terms of implementation resources, in-service or direct communication.

Teachers interviewed suggested that one of the major problems, the lack of understanding of the vocabulary connected with mathematics, has not yet been addressed. Also, the lack of acceptance of Applications of Mathematics at the college and university levels was seen as a barrier to the status of the course and enrolments. Finally, some teachers expressed concern regarding the implementation of mathematics when the Western Canada Protocols are introduced into Provincial curriculum over the next three years

In partnership with CISCO (Computer Information Systems Company), the school has developed an extensive Information Technology program which includes staff training, and partnership support for the necessary equipment and implementation. The school administrator, program teachers and teachers in the school reported that this is a very successful program, which enhances other programs and student transition to post-secondary and the workplace. Administrators and staff provided examples of student successes such as obtaining jobs or entering post-secondary.

Evaluation of Applied Academics Courses

Math teachers have developed an evaluation matrix which students receive at the beginning of the course. This includes students receiving 20% for seatwork, which is assessed three times each term; 30% for unit quizzes and tests, which may be rewritten as difficulties are overcome; 20% for group laboratories, with opportunities to resubmit; and 30% for exams, with the opportunity to complete a parallel rewrite exam. Students are expected to use both scientific and graphing calculators in the course. Teachers reported that the option of upgrading marks is an incentive for students to achieve math competencies.

As mentioned earlier, Technical and Professional Communications 12 is not offered at this school. English teachers reported that they encourage students to participate in projects and have had students publish in the local paper. They expressed a strong belief that the TPC learning outcomes are met within the English 12 curriculum at this school.

Support for Applied Academics

The Assistant Superintendent and school administration at this site reported that they support Applied Academics Programs. During the focus meeting with staff involved in Applied Academics and other programs, positive comments in support of the Applied Academics Programs that are in place in the school were provided.